Vol. 1010 Number 2

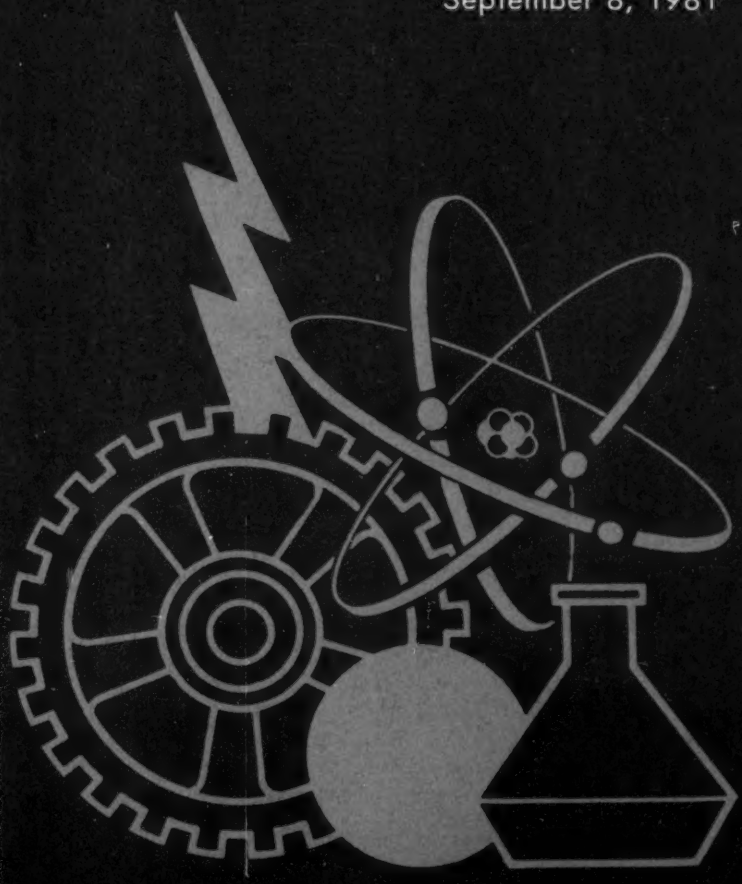
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 8, 1981



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Office

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

September 8, 1981 Volume 1010 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,819,468, Re. S.N. 257,995, Filed Apr. 27, 1981, Cl. 428/99, HIGH TEMPERATURE INSULATION MODULE, Robert A. Sauder, et al., Owner of Record: *Sauder Industries, Inc., Emporia, Kan.,* Attorney or Agent: Sydney Leach, Ex. Gp.: 164

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

Re. 27,401, Reexam. No. 90/000,052, Requested: Aug. 12, 1981, Cl. 521/142, CROSS-LINKED HYDROPHILIC POLYMERS AND ARTICLES MADE THEREFROM, Otto Wichterle & Drahoslav Lim, Owner of Record: *Flexible Contact Lens (Nev.), Inc.,* Attorney or Agent: Cushman, Darby & Cushman, Ex. Gp.: 140, Requester: Continuous Curve Contact Lenses, Inc. & Soft Lenses, Inc., San Diego, Calif.

3,361,858, Reexam. No. 90/000,053, Requested: Aug. 12, 1981, Cl. 264/2.6, RESHAPING A XEROGEL BY MECHANICAL REMOVAL AND SWELLING TO FORM A HYDROGEL CONTACT LENS, Otto Wichterle, Owner of Record: *Flexible Contact Lens (Nev.), Inc.,* Attorney or Agent: Cushman, Darby & Cushman, Ex. Gp.: 140, Requester: Continuous Curve Contact Lenses, Inc. & Soft Lenses, Inc., San Diego, Calif.

3,543,073, Reexam. No. 90/000,044, Requested: Aug. 4, 1981, Cl. 313/421, VACUUM TUBES OF TELEVISION TYPE FOR X-RAY PROTECTION, Edward E. Sheldon, Owner of Record: *Inventor,* Attorney or Agent: Polachek & Saulsbury, Ex. Gp.: 250, Requester: Oblon, Fisher, Spivak, McClelland & Maier, Arlington Va.

3,822,089, Reexam. No. 90/000,054, Requested: Aug. 12, 1981, Cl. 351/160, CONTACT LENS BLANK OR REPLICA MADE FROM ANHYDROUS, SPARINGLY CROSS-LINKED HYDROPHILIC COPOLYMERS, Otto Wichterle, Owner of Record: *Flexible Contact Lens (Nev.), Inc.,* Attorney or Agent: Cushman, Darby & Cushman, Ex. Gp.: 257, Requester: Continuous Curve Contact Lenses, & Soft Lenses Inc., San Diego, Calif.

3,956,540, Reexam. No. 90/000,051, Requested: Aug. 10, 1981, Cl. 427/443.2, METHOD OF COATING ARTICLES, Albert J. Laliberte, et al., Owner of Record: *Omnitech, Inc.,* Attorney or Agent: Shenier & O'Connor, Ex. Gp.: 162, Requester: Brumbaugh, Graves, Donohue & Raymond, New York, N.Y.

4,081,757, Reexam. No. 90/000,048, Requested: Aug. 7, 1981, Cl. 330/124, PARALLEL POWER AMPLIFIER CIRCUITS, Paul S. Rumbaugh, Owner of Record: *Altec Corp.,* Attorney or Agent: Edward A. Sokolski, Ex. Gp.: 250, Requester: Ray Ivie, Orem, Utah

4,122,508, Reexam. No. 90/000,049, Requested: Aug. 7, 1981, Cl. 361/384, MODULAR PRINTED CIRCUIT BOARD ASSEMBLY HAVING COOLING MEANS INCORPORATED THEREIN, Paul S. Rumbaugh, Owner of Record: *Altec Corp.,* Attorney or Agent: Edward A. Sokolski, Ex. Gp.: 210, Requester: Ray Ivie, Orem, Utah

4,180,780, Reexam. No. 90/000,050, Requested: Aug. 7, 1981, Cl. 330/252, INPUT DECOUPLING CIRCUIT FOR TRANSISTOR DIFFERENTIAL AMPLIFIER, Paul S. Rumbaugh, Owner of Record: *Altec Corp.,* Attorney or Agent: Edward A. Sokolski, Ex. Gp.: 250, Requester: Ray Ivie Orem, Utah

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Vacancy Announcement
Chairman, Trademark Trial and Appeal Board

In accordance with the Senior Executive Service, the position of Chairman of the Trademark Trial and Appeal Board is being advertised. This appointment will be made at a salary of $50,113 per annum, which is the current statutory limit before awards and bonuses are distributed.

Persons interested in being considered for the vacancy, PTO-81-112, are invited to submit their applications to the address given below, on or before Sept. 30, 1981. Applications must be in the Office of Personnel by Sept. 30, 1981. The duties, qualifications, and factors which will be considered in evaluating the candidates are described below.

Duties: Serves as Chairman, Trademark Trial and Appeal Board. Manages the administrative functions of the Board and supervises the technical work of the Board. As a member of the TTAB, exercises original jurisdiction in *inter partes* proceedings and appellate jurisdiction of *ex parte* appeals. Renders written decisions representing the position of the PTO.

Qualifications: Evaluation of qualified candidates will be on the basis of education (self-development), awards, supervisory performance appraisals, managerial/executive qualifications and technical/professional qualifications. Candidates should address all these qualifications in their supplemental statements. Copies of the Qualification Standard are available in Crystal Plaza 2, Room 9C05.

Factors Which Will be Considered in Evaluating Qualified Candidates:

The six managerial/executive factors for SES positions are:

1. Integration of internal and external program policy issues;
2. Organization representation and liaison;
3. Direction and guidance of program, projects or policy development;
4. Resource acquisition and administration;
5. Utilization of human resources;
6. Review of implementation and results.

The technical/professional qualifications are:

1. Law degree and bar membership;
2. Professional legal experience which has provided a comprehensive knowledge of Appellate matters in Trademark law, rules of evidence, the Federal Rules of Civil Procedures, and general principles of ancillary legal subjects;
3. Demonstrated ability to express thoroughly, clearly and accurately the material facts, legal principles and reasons for arriving at a stated conclusion by the application of law to the facts.

Employees of the Department of Commerce may apply by submitting a Merit Program Interest Statement (CD-261), OPM Form 1386, current performance appraisal, updated Personal Qualifications Statement (SF-171) and supplemental statement showing how the qualifications are met. Persons who are not employees of the Department of Commerce should submit a current performance appraisal, Personal Qualifications Statement (SF-171), OPM Form 1386, and supplemental statement. The completed forms should be sent to:

U.S. Patent and Trademark Office
Office of Personnel
Crystal Plaza 2, Room 9C05
2011 Jefferson Davis Hwy.
Arlington, Va. 22202

Questions concerning this notice should be directed to Ms. Marilyn Gannon, Office of Personnel, Room 2-9C05, Telephone (703) 557-3631.

MARGARET M. LAURENCE
July 27, 1981 *Assistant Commissioner for Trademarks.*

Availability of U.S. Patent Classification Microfilms

The Patent and Trademark Office is discontinuing publication of two patent classification microfilms previously offered to the public through the National Technical Information Service. These microfilms are the U.S. Patent Classification—Numeric Listing, which provides users with the original and all cross-reference classifications for individual patents in ascending patent number sequence, and the U.S. Patent Classification—Subclass Listing, which consists of listings of all patent numbers classified into each of the classes and subclasses of the U.S. patent classification, both as original and cross-reference entries. Updated editions of these microfilms will in the future be published by Research Publications, Inc., 12 Lunar Drive, Woodbridge, CT 06525, Telephone (203) 397-2600. Persons interested in obtaining new editions of either of these microfilms may contact that company.

RENE D. TEGTMEYER
Aug. 14, 1981. *Assistant Commissioner for Patents*

PATENT NOTICES

Certificates of Correction for the Week of Sept. 8, 1981

Re. 30,603	4,243,049	4,259,359	4,268,836
3,193,248	4,243,722	4,259,462	4,269,216
3,928,537	4,244,971	4,259,529	4,269,264
3,932,661	4,244,972	4,260,306	4,269,852
3,994,872	4,245,537	4,260,651	4,269,864
4,057,595	4,246,186	4,260,751	4,269,944
4,057,633	4,246,278	4,260,873	4,270,210
4,100,192	4,247,801	4,261,180	4,270,553
4,102,895	4,248,408	4,261,224	4,270,790
4,133,985	4,248,795	4,261,498	4,270,883
4,134,892	4,249,102	4,261,749	4,271,199
4,154,950	4,250,013	4,261,827	4,271,259
4,156,916	4,250,730	4,262,188	4,271,418
4,167,501	4,250,918	4,262,371	4,271,566
4,174,512	4,251,478	4,262,871	4,271,609
4,181,893	4,252,050	4,263,273	4,271,959
4,188,209	4,252,300	4,263,319	4,272,560
4,188,342	4,252,434	4,263,484	4,272,610
4,198,138	4,252,683	4,263,879	4,272,983
4,200,800	4,252,800	4,263,915	4,273,789
4,204,767	4,253,374	4,264,224	4,273,891
4,211,702	4,255,007	4,264,367	4,274,023
4,217,489	4,255,474	4,264,564	4,274,050
4,219,744	4,255,590	4,264,584	4,274,750
4,220,522	4,255,713	4,264,877	4,274,853
4,222,793	4,255,883	4,265,439	4,274,861
4,229,563	4,256,332	4,265,878	4,275,008
4,232,366	4,256,669	4,266,062	4,275,010
4,232,370	4,256,739	4,266,348	4,275,195
4,232,924	4,257,705	4,266,460	4,275,306
4,234,283	4,257,952	4,266,512	4,275,442
4,234,530	4,257,986	4,266,565	4,276,149
4,234,610	4,258,027	4,266,815	4,276,155
4,238,809	4,258,104	4,267,352	4,276,185
4,239,235	4,258,724	4,267,574	4,277,240
4,239,780	4,258,898	4,268,275	4,277,487
4,242,416	4,259,106	4,268,645	4,277,593
4,242,531	4,259,319	4,268,718	

National Technical Information Service

U.S. GOVERNMENT OWNED IINVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing.

Copies of patents cited are available for the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications icited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

DOUGLAS J. CAMPION
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

U.S. DEPARTMENT OF THE ARMY/OTJAG

Chief, Intellectual Property Division
Room 2D 444, Pentagon
Washington, D.C. 20310

Patent application 6-194,192. Process for the Recovery of Carborane from Reject Propellant. Filed Oct. 6, 1980.

Patent application 6-194,646. Lightweight One Piece Side Rack with Stakes for Flatbed Semitrailers. Filed Oct. 6, 1980.

Patent application 6-198,577. Homodyne Radar System. Filed Oct. 20, 1980.

Patent application 6-205,359. Pulse Width Spectrum Analyzer. Filed Nov. 10, 1980.

Patent application 6-209,809. Hemispherical Coverage Microstrip Antenna. Filed Nov. 24, 1980.

Patent application 6-214,367. Priority Circuit for Service Request Signals. Filed Dec. 8, 1980.

Patent application 6-218,235. Glass Lead Seal Test Apparatus. Filed Dec. 19, 1980.

Patent application 6-218,400. Cure Rate Inhibitors for Ferrocene-Containing Propellants. Filed Dec. 19, 1980.

Patent application 6-219,056. Stable NF_4^+ Salt of High Flourine Content. Filed Dec. 22, 1980.

Patent application 6-221,737. Combined Side Lobe Canceller and Frequency Selective Limiter. Filed Dec. 31, 1980.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP
1900 Half St., S.W.
Washington, D.C. 20324

Patent application 6-100,320. Fiber Optic Rotation Sensing Interferometer. Filed Dec. 5, 1979.

Patent application 6-179,597. Troposcatter System Antenna Alignment. Filed Aug. 19, 1980.

Patent application 6-216,103. Automatically Sequenced Signaling System. Filed Dec. 15, 1980.

Patent application 6-219,396. Polyaromatic Amides. Filed Dec. 22, 1980.

Patent application 6-225,546. Grease Compositions. Filed Jan. 16, 1981.

Patent 4,254,688. Low Friction Servo Valve. Filed May 3, 1979. Patented Mar. 10, 1981. Not available NTIS.

Patent 4,257,164. Optical Protractor. Filed Nov. 9, 1978. Patented Mar. 24, 1981. Not available NTIS.

Patent 4,258,965. Adjustable Electronic Circuit Card Supporter. Filed Aug. 3, 1979. Patented Mar. 31, 1981. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Director, Navy Patent Program/
Patent Counsel for the Navy
Office of Naval Research
Code 302
Arlington, Va. 22217

Patent application 6-230,984. Low Sidelobe Pulse Compressor. Filed Feb. 3, 1981.

Patent application 6-236,948. 360 Degree Closed Circuit Television System. Filed Feb. 23, 1981.

Patent 4,207,450. Continuous Oil Concentration Monitor. Filed June 14, 1978. Patented June 10, 1980. Not available NTIS.

Patent 4,243,935. Adaptive Detector. Filed May 18, 1979. Patented Jan. 16, 1981. Not available NTIS.

Patent 4,243,949. Frequency Stabilization Technique for Microstrip Oscillators. Filed Nov. 17, 1978. Patented Jan. 6, 1981. Not available NTIS.

Patent 4,243,991. Antenna Feed for Scan-with-Compensation Tracking. Filed May 30, 1978. Patented Jan. 6, 1981. Not available NTIS.

Patent 4,249,143. Xenon Fluoride and Mercury Chloride Photodissociation Lasers. Filed Apr. 25, 1979. Patented Feb. 3, 1981. Not available NTIS.

Patent 4,249,257. Radio Frequency Signals Analyzer. Filed Sept. 1, 1977. Patented Feb. 3, 1981. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 25, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	4-29-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	6-25-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	7-11-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-03-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director ..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-07-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	1-03-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-31-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	6-08-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-28-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	11-01-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-09-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	2-06-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,139,622 to 3,142,840, inclusive

Plant Patents ..... Numbers 2,416 to 2,430, inclusive

PATENT EXAMINING CORPS

PATENT EXAMINING GROUPS

CHEMICAL EXAMINING GROUPS

[illegible]

ELECTRICAL EXAMINING GROUPS

[illegible]

MECHANICAL EXAMINING GROUPS

[illegible]

REISSUES

SEPTEMBER 8, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

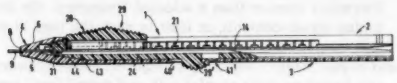
Re. 30,733
BLADE-HOLDING CUTTING DEVICE

Michel Quenot, Ornans, France, assignor to Stanley-Mabo S.A., Besancon, France

Original No. 4,103,421, dated Aug. 1, 1978, Ser. No. 792,194, Apr. 29, 1977. Application for reissue Mar. 5, 1980, Ser. No. 127,480

Int. Cl.³ B26B *3/06*

U.S. Cl. 30—162 **8 Claims**



1. In a cutting blade holding handle having a segmented removable blade comprising a unitary generally rectangular hollow body formed of a molded plastics material and having a longitudinal slot extending through one side wall from one end thereof, a pair of facing longitudinal grooves within said hollow body terminating in an end slot through the other end of said body to slidably mount the blade to advance and retract the blade through said end slot, a series of notches formed along one edge of said longitudinal slot, and a unitary slider adapted to control the longitudinal movement of the blade, the improvement comprising a wedging member engageable with one side of the blade, said hollow body having an inclined interior wall adjacent said end slot, and said wedging member having a bevelled end engageable therewith to frictionally engage and apply a lateral pressure against the blade and means to slide said wedging member from an inactive position in which the wedging member does not apply lateral pressure to the blade to an active position wherein the wedging member is slid up the inclined interior wall adjacent said end slot and the bevelled end of said wedging member frictionally engages and applies a lateral pressure against the blade to lock the blade in position.

Re. 30,734
REVOLVING SELF-SERVICE DISPLAY STAND

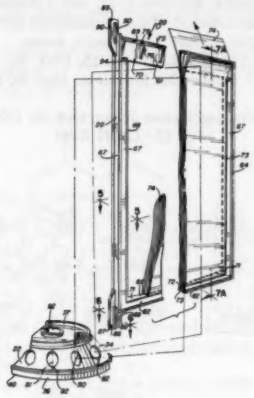
Ronald P. Eckert, Northbrook, Ill., assignor to DLM, Inc., Niles, Ill.

Original No. 4,102,069, dated Jul. 25, 1978, Ser. No. 703,958, Jul. 9, 1976. Application for reissue Oct. 26, 1978, Ser. No. 955,275

Int. Cl.³ G09F *11/02*

U.S. Cl. 40—497 **22 Claims**

1. A revolving self-service poster display stand having a base, an upstanding pedestal mounted on said base for revolving about a vertical axis, a plurality of frames radially projecting from said pedestal, each frame having one side wall with upper and lower pivot members carried thereby, said upper and lower pivot members being cruciform in cross section and extending into elliptical openings formed in spaced conically sloping surfaces of said pedestal, and means on said lower pivot member for engaging with means on the edge of one of said



elliptical openings for positioning said frame in a radially oriented position under the influence of the weight of said frame.

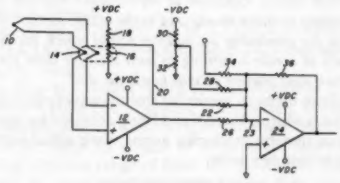
Re. 30,735
AUTOMATIC THERMOCOUPLE REFERENCE JUNCTION COMPENSATOR

Eugene T. Ihlenfeldt, Enumclaw, and David E. Marshall, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Original No. 4,157,663, dated Jun. 12, 1979, Ser. No. 899,957, Apr. 25, 1978. Application for reissue Jun. 9, 1980, Ser. No. 157,771

Int. Cl.³ G01K *7/12*

U.S. Cl. 73—361 **4 Claims**



1. Temperature measuring apparatus comprising a measuring thermocouple adapted to be placed in contact with an object whose temperature is to be measured, thermocouple reference junction means connected in series-opposition with said measuring thermocouple, [a] temperature compensation [resistor] *means* whose [resistivity] *output signal* varies as a function of ambient temperature, first and second differential amplifiers each having a pair of input terminals, ungrounded conductors connecting said measuring thermocouple and said reference junction means across the input terminals of said first differential amplifier, a source of bias voltage, and means [connecting said source of] *for applying said* bias voltage, the output *signal* of said first differential amplifier, said *output signal of said* compensation [resistor] *means* and a temperature command signal to one of the input terminals of said second differential amplifier, the other input terminal of said

second differential amplifier[, said source of bias voltage and said compensation resistor] being connected to ground.

Re. 30,736
TONE WAVE GENERATOR IN ELECTRONIC MUSICAL INSTRUMENT

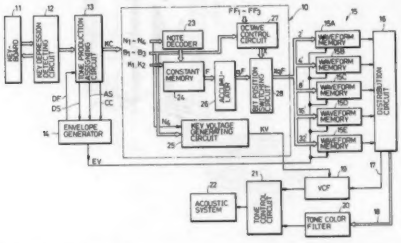
Teruo Hiyoshi; Akira Nakada, both of Hamamatsu; Tsutomu Suzuki, Shizuoka; Eiichiro Aoki, and Takatoshi Okumura, both of Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Original No. 4,179,972, dated Dec. 25, 1979, Ser. No. 841,716, Oct. 13, 1977. Application for reissue May 30, 1980, Ser. No. 154,994

Claims priority, application Japan, Oct. 18, 1976, 51-124529

Int. Cl.[3] **G10H** *7/00*

U.S. Cl. 84—1.11 **20 Claims**



11. A tone wave generator in an electronic musical instrument, which comprises:

a keyboard including playing keys,

key code generating means for producing a key code which includes a note data portion and an octave data portion thereby identifying a key operated in the keyboard,

constant memory means for storing constants corresponding to musical tone frequencies to be generated in correspondence to notes included in one out of a plurality of groups into which keys of a keyboard are divided separately on the octave basis,

readout means for reading out a constant from said constant memory means according to the note data portion of said key code,

operation means responsive to the constant read out from said constant memory means and to the octave portion of said key code for producing an address signal which varies progressively at a rate according to both the note data portion and octave data portion of said key code, and

waveform memory means for storing waveform information in each address thereof and being accessed by said address signal thereby producing a tone wave signal corresponding to said key code.

Re. 30,737
ELECTRONIC CIRCUIT FOR USE IN A VARIETY OF ENGINE CONTROL SYSTEMS

La Verne A. Caron, Rochester, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Original No. 4,102,310, dated Jul. 25, 1978, Ser. No. 752,493, Dec. 20, 1976. Application for reissue Apr. 2, 1979, Ser. No. 26,490

Int. Cl.[2] **F02P** *1/00, 5/04*

U.S. Cl. 123—415 **16 Claims**

1. In an internal combustion engine, an electronic engine timing control circuit for providing control of an engine function comprising:

an output stage which is switched from one state to another state for producing an output signal;

an output terminal connected with said output stage at which said output signal is given;

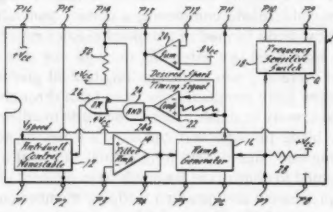
a first input terminal receiving a variable frequency trigger signal representative of engine speed;

a second input terminal receiving a variable frequency trigger signal representative of engine speed;

a third input terminal receiving a desired timing signal derived from at least one parameter useful in controlling said engine function and representing desired timing of said output signal; and

circuit means coupling said three input terminals and said output stage such that the trigger signal at said first input terminal always causes said output stage to produce said output signal so long as said output stage is in its one state at the time that the effect of the trigger signal received at said first input terminal is felt by said output stage, and when the trigger signal at said second input terminal has a frequency greater than a selected frequency, the desired timing signal controls, at least in part, the time at which said output stage produces said output signal;

said circuit means comprising a frequency sensitive switch circuit having an input coupled with said second input terminal to receive the variable frequency trigger signal which is received at said second input terminal, said frequency sensitive switch circuit comprising means providing at an output thereof a logic signal having a first logic level when the frequency of the trigger signal received at said second input terminal is below said selected frequency and a second logic level when the frequency of the last-mentioned signal exceeds said selected frequency;



said circuit means further comprising an OR logic gate having a pair of inputs and an output, means coupling said first input terminal with one input of said OR logic gate to always couple the variable frequency trigger signal received at said first input terminal to said one input of said OR logic gate regardless of the level of the logic signal of said frequency sensitive switch circuit, and means coupling the output of said frequency sensitive switch circuit and said third input terminal with the other input of said OR logic gate such that said desired timing signal is coupled to said other input of said OR logic gate only when the logic signal of said frequency sensitive switch circuit is at its second logic level; and

utilization means coupled to said output terminal for providing control of said engine function by said output signal.

Re. 30,738
APPARATUS AND METHOD FOR IN SITU HEAT PROCESSING OF HYDROCARBONACEOUS FORMATIONS

Jack Bridges, Park Ridge, and Allen Taflove, Wilmette, both of Ill., assignors to IIT Research Institute, Chicago, Ill.

Original No. 4,144,935, dated Mar. 20, 1979, Ser. No. 828,621, Aug. 29, 1977. Application for reissue Feb. 6, 1980, Ser. No. 118,957

Int. Cl.[3] **E21B** *43/24, 43/30*

U.S. Cl. 166—248 **97 Claims**

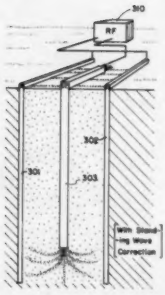
83. A system for in situ heat processing of hydrocarbonaceous earth formations, comprising

a waveguide structure comprising a plurality of electrodes

bounding a particular volume of earth formations as a dielectric medium bounded therein; and

means for supplying electromagnetic energy to said waveguide structure at a frequency selected to dissipate said electromagnetic energy substantially only to said bounded medium thereby to substantially uniformly heat said bounded volume.

92. A method for in situ heat processing of hydrocarbonaceous earth formations comprising the steps of:



bounding a particular volume of earth formations with a waveguide structure comprising elongate electrodes having outer electrodes which are at approximately the same potential as the adjacent unbounded earth formations; and

propagating electromagnetic energy through the waveguide structure in an aggregate mode of propagation generally parallel to the direction of an elongate axis of said electrodes, thereby substantially confining the electromagnetic energy in the waveguide structure and uniformly heating the bounded volume of earth formations.

Re. 30,739

ANOREXIC CHROMANS

Derek V. Gardner, Stortford, England, assignor to Beecham Group Limited, England

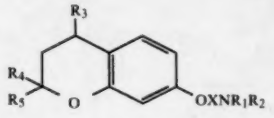
Original No. 4,080,335, dated Mar. 21, 1978, Ser. No. 652,041, Jan. 26, 1976. Continuation-in-part of Ser. No. 599,694, Jul. 28, 1975, abandoned. Application for reissue May 14, 1979, Ser. No. 38,737

Claims priority, application United Kingdom, Jul. 30, 1974, 33549/74

Int. Cl.[3] **C07D** *311/02, 207/04;* **A61K** *31/35, 31/40*

U.S. Cl. 260—345.2 **8 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof wherein

X is alkylene of 2–4 carbon atoms;

R_1 is hydrogen or alkyl of 1–6 carbon atoms;

R_2 is hydrogen, alkyl of 1–6 carbon atoms or benzyl;

R_3 is 1-naphthyl or 2-naphthyl;

R_4 is hydrogen or alkyl of 1–4 carbon atoms; and

R_5 is hydrogen or alkyl of 1–4 carbon atoms.

Re. 30,740

INSECTICIDAL COMPOSITION FOR ULTRA LOW VOLUME APPLICATION

Heinz Frensch, Frankfurt am Main; Konrad Albrecht, Fischbach, and Norbert Taubel, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Original No. 3,952,102, dated Apr. 20, 1976, Ser. No. 536,363, Dec. 26, 1974. Application for reissue Jan. 12, 1979, Ser. No. 3,001

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1973, 2364892

Int. Cl.[3] **A01N** *43/24*

U.S. Cl. 424—276 **3 Claims**

1. An insecticidal composition for ultra low volume application, which comprises

a. from 15 to 35 weight % of 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepine-3-oxide,

b. from 60 to 84.5 weight % of a solvent mixture of 1.5 to 2.5 parts by weight of a vegetable oil consisting of rapeseed, cottonseed, peanut, sunflower, or safflower oil, and from 0.5 to 1.5 parts by weight of an aromatic hydrocarbon having a boiling range of from 170° to 250° C. consisting of one or more alkyl benzenes having 9 to 11 carbon atoms; or 1-or 2-methyl naphthalene; and

c. from 0.5 to 6 weight % of an epoxide selected from the group consisting of epichlorohydrin, epoxypropane, styrene oxide, phenylepoxy propane, and an expoxide of an unsaturated vegetable oil.

PLANT PATENTS

GRANTED SEPTEMBER 8, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,764

CHRYSANTHEMUM PLANT

Jack M. Meek, and William E. Duffett, both of Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Jun. 18, 1980, Ser. No. 160,825
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat., plant known by the cultivar name Pert, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; dark yellow ray floret color; diameter across face of capitulum ranging from 70 to 90 mm. at maturity; uniform eight week photoperiodic flowering response to short days; short plant height when grown as a pinched spray pot, and semi-spreading branching pattern.

4,765

CHRYSANTHEMUM PLANT

Lawrence A. Weber, Milwaukie, Oreg., assignor to Weber's Riverside Greenhouses, Milwaukie, Oreg.

Filed Sep. 12, 1979, Ser. No. 75,151
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat., known by the cultivar name Golden Bowl, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of decorative capitulum type; informal incurved form; golden yellow ray floret color; diameter across face of capitulum from 125 to 150 mm. at maturity; uniform ten week flowering response to photoperiodic short-day control; medium plant height, and spreading branching pattern.

PATENTS

GRANTED SEP. 8, 1981

ERRATA

For CLASS	See PATENT NO.
256–001	4,287,637
411–042	4,287,807
081–429	4,287,923
294–143	4,288,012
294–087	4,288,013
493–420	4,288,067
501–078	4,288,250
501–105	4,288,251

PATENTS

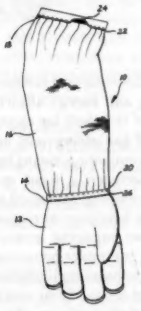
GRANTED SEPTEMBER 8, 1981

GENERAL AND MECHANICAL

4,287,607
BALLISTIC VESTS
Jack Leach, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed May 17, 1979, Ser. No. 39,780
Int. Cl.[3] F41H *1/02*
U.S. Cl. 2—2.5 **15 Claims**

1. A ballistic vest comprising a plurality of double cloth layers of loosely woven aramid fiber, the layers of double woven cloth being stitched together at predetermined spaced intervals by selected yarns passing from one cloth sheet to the other;
means for providing elongation to the vest and providing surfaces on which said layers of double woven cloth can slide in response to projectile impact; and
means for loosely maintaining said layers of double woven cloth and elongation providing means together so that shape and flexibility are maintained.

4,287,608
APIARIAN PROTECTOR
Michael S. Meyer, Rte. 1, Box 175, Monmouth, Oreg. 97361
Filed May 29, 1979, Ser. No. 42,806
Int. Cl.[3] A41D *13/08*
U.S. Cl. 2—16 **5 Claims**

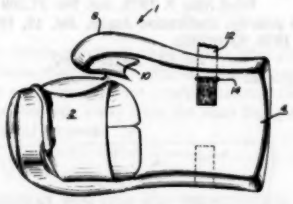


1. Apiarian hand and arm protector comprising
a sleeve formed of a solid-weave, closed-texture fabric woven from synthetic filament yarn, said sleeve being designed to fit loosely about the wearer's forearm, and extend thereon adjacent the wearer's elbow, at one sleeve end to the wearer's wrist, at the other sleeve end,
means for securing said one sleeve end to the wearer's arm, adjacent the elbow, and
means for binding the other sleeve end adjacent the wearer's wrist, to prevent bees from penetrating therebetween.

4,287,609
PROTECTIVE HAND WRAP FOR ATHLETES
James M. Amadeo, 821 23, West Des Moines, Iowa 50265
Filed May 31, 1979, Ser. No. 44,119
Int. Cl.[3] A41D *13/08*
U.S. Cl. 2—16 **23 Claims**

1. A protective hand wrap for athletes, comprising:
an elongated strip of flexible material sufficient in length for multiple windings about the hand, knuckles and wrist of the user,
said strip having a starting end and a fastening end,
means on said starting end for engaging the thumb of a hand from which said strip is trained in multiple windings about the hand, knuckles and wrist to terminate in windings about the wrist,
fastening means on said fastening end to secure said windings against accidental release, and
independent finger encircling means on said strip between the ends.

4,287,610
PROTECTIVE DEVICE WITH SHAPE DEVELOPING AND SECURING MEMBER
Jhoon G. Rhee, 2000 L St., NW., Washington, D.C. 20036
Filed Sep. 27, 1979, Ser. No. 79,417
Int. Cl.[3] A41D *13/10*
U.S. Cl. 2—18 **16 Claims**

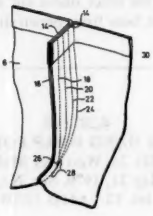


1. A protective device for wearing on a body member of a user comprising a resilient cushion-like sheet protective member and a flexible sheet-like shape developing member bonded to an inside of the protective member; wherein the shape developing member has a portion which is not bonded to the protective member and which extends across the inward curvature of the protective member whereby forming a securing means for securing the protective device to the body of the wearer.

4,287,611
ADJUSTABLE GARMENT

Linda Lundstrom, 9 Phoebe St., Toronto, Ontario, Canada (M5T 1A8)

Filed Apr. 29, 1980, Ser. No. 144,814
Int. Cl.³ A41F 9/00; A41D 1/06
U.S. Cl. 2—237 **1 Claim**

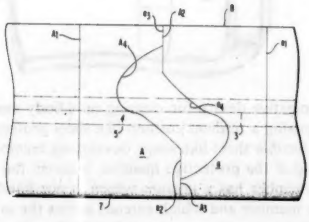


1. In a pair of slacks having a seat portion having an upper edge and a crotch, a central rear seam structure for permitting enlargement of the garment, said seam structure comprising: first and second fabric edge portions overlapping each other and forming a double thickness of said fabric extending from said upper edge to said crotch, said fabric edge portions each having a free edge and each extending outwardly from said free edge into the remainder of said seat portion, a first seam centrally located in said seat portion and extending along said fabric edge portions adjacent said free edge from said upper edge to said crotch and fixing said fabric edge portions together adjacent said free edge, a second seam joining said fabric edge portion together outwardly of said free edge, said second seam extending from said upper edge to said crotch and being spaced from said first seam at said upper edge and converging to join said first seam at said crotch, said second seam being removable to permit enlargement of said garment, and a plurality of successive further seams, each extending from said upper edge to said crotch and each spaced outwardly from the preceeding seam and each converging toward said first seam and joining said first seam at said crotch, said second seam and each further seam after joining said first seam having an overlapping portion overlying said first seam, said first seam being formed by a first thread, said second seam and each further seam being formed by a discreet additional thread.

4,287,612
METHOD OF MAKING AND ORNAMENTING SHIRTS AND SHORTS

Minoru Tanaka, 419-banchi Hatanosho Taharamotomachi, Shiki-gun Nara-pref., Japan

Filed May 9, 1979, Ser. No. 37,369
Claims priority, application Japan, Jul. 19, 1978, 53-88848; Aug. 18, 1978, 53-101031
Int. Cl.³ A41D 17/02
U.S. Cl. 2—243 R **11 Claims**



1. Method of producing body garments having a generally symmetrical profile when viewed from the front or back and a profile when viewed from the side which is assymmetrical comprising the steps of:

laying out a length of tubular material sufficient to make an even number of garments to provide two plies of said material collapsed into a flat plane in which the elongated center line of said collapsed material defines a vertical line disposed along the respective sides of the finished garment;

applying a design to the longitudinally extending central surface of said collapsed material, said design being intended to cover an area at the side of a finished garment;

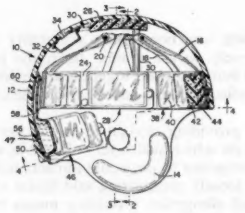
severing said two plies of collapsed material transversely along two longitudinally spaced lines which define the waist lines of two oppositely disposed garments, and;

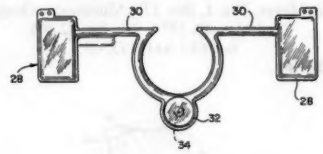
severing said two plies of collapsed material transversely at a location medial of said first two lines and removing superposed pieces of material having identical outlines from both of said plies to provide openings for the extremities of the body remote from the waist.

4,287,613
HEADGEAR WITH ENERGY ABSORBING AND SIZING MEANS

Arthur M. Schulz, Roselle, Ill., assignor to Riddell, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 56,273, Jul. 9, 1979, abandoned.
This application Oct. 6, 1980, Ser. No. 194,351
Int. Cl.³ A42B 3/02
U.S. Cl. 2—413 **9 Claims**





1. In a headgear construction comprising a helmet shell, and a plurality of sizing and energy-absorbing means mounted on the inside surface of the shell for engaging the wearer's head, the combination of the sizing and energy absorbing means comprising a crown-engaging means including means for varying the distance between a head engaging portion of the crown-engaging means and said shell surface for thereby controlling the fit of the heargear, energy-absorbing means associated with the crown-engaging means whereby high impact forces do not result in contact between the shell and the wearer's head, and the combination including energy absorbing and sizing means located on the front and back, the sides, and the lower rear inside shell surfaces, the energy absorbing and sizing means on the side surfaces including air-inflatable means defining a side-to-side fitting dimension for the headgear, and first means for controlling the inflation of the air-inflatable means to control the side-to-side fitting dimension, said first

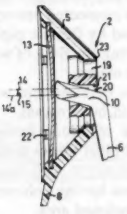
means operating independently of said means for varying the distance between said head engaging portion and said shell, and second means for controlling the fit of the energy absorbing and sizing means on the lower rear surface operating independently of said first means, and also independently of said means for varying the distance between said head engaging means and said shell, the improvement wherein the sizing and energy-absorbing means located on the front and back surfaces of the shell comprise pad structures defining a fixed, non-inflatable front-to-back fitting dimension by said headgear, said pad structures being curved to thereby embrace the forehead and back of the wearer's head whereby the helmet is centered relative to the long axis of the head prior to inflation of said air inflatable means, and means releasibly retaining said pad structures on said front and back surfaces whereby pad structures of different dimensions may be located thereon, and whereby the fit of the helmet may thereby be varied.

4,287,614

FASTENING MEANS FOR FITTING AN ACCESSORY, ESPECIALLY AN EAR MUFF, TO A SAFETY HELMET

Bo G. Lönnstedt, Kvarnbergsvägen 23, S-14145 Huddinge, Sweden

Filed May 20, 1980, Ser. No. 151,595
Claims priority, application Sweden, May 28, 1979, 7904611
Int. Cl.³ A42B *3/00, 1/24*
U.S. Cl. 2—423 **9 Claims**



1. A fastening means for fitting an accessory, e.g. an ear muff, on a safety helmet or the like, where an arm, intended for an accessory, is supported at a pivoting end portion in a housing intended for attaching to the helmet, the arm thus forming a two-armed lever, the pivoting end portion of which, situated in the housing, being acted on by a spring means having a convex side, said spring means arranged in the housing, to urge the opposite, free end of the arm, situated outside the housing, in a direction towards the head of the wearer, characterized in that the pivoting end portion of the arm has a contact portion for bearing against the central portion of the convex side of the spring means, which is of the disc type and which is retained at its periphery to the side of the housing intended to face towards the outside of the helmet, the force of the spring means having a line of action essentially perpendicular to the intended plane of contact between the helmet and the housing.

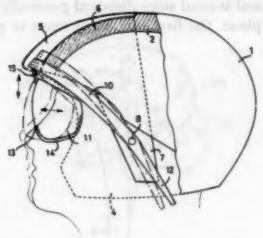
4,287,615

HELMET HAVING A WITHDRAWABLE SHIELD

Claude P. Morin, 16 bis Rue A. PRO„ 77 Vaux Le Penil, France

Filed Mar. 3, 1980, Ser. No. 126,755
Claims priority, application France, Mar. 2, 1979, 79 05445
Int. Cl.³ A42B *3/02;* A61F *9/04*
U.S. Cl. 2—424 **7 Claims**

1. A helmet structure comprising an outer shell, a shield which is movable between a position of use in front of the eyes of the wearer of the helmet and a withdrawn position and has a lower notch adapted to rest on the nose of the wearer, a support for the shield and comprising a bow member which is mounted in two diametrically opposed lateral portions of the bow member on the outer shell to pivot relative to the shell substantially forwardly and downwardly to bring the shield to said position of use and substantially rearwardly and upwardly to bring the shield to said withdrawn position, and which has an intermediate portion intermediate said lateral portions, and elastically yieldable connecting means connecting the shield to



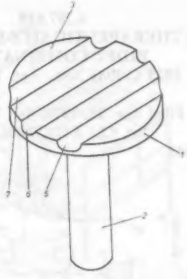
said intermediate portion of the bow member and being operative to bias the shield relative to the bow member inwardly of the shell in said position of use of the shield, in which position of use the shield is free to be moved by the biasing action of the elastically yieldable means.

4,287,616

AUDITORY OSSICLE PROSTHESIS

Gunther Heimke, Weinheim; Dietrich Plester, and Klaus Jahnke, both of Tubingen, all of Fed. Rep. of Germany, assignors to Friedrichsfeld GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 6, 1980, Ser. No. 118,910
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1979, 2905183; Sep. 19, 1979, 2937842
Int. Cl.³ A61F *1/24*
U.S. Cl. 3—1.9 **5 Claims**



1. Auditory ossicle prosthesis comprising a rigid plate and a depending tubular shaft formed integrally as a one-piece construction from a biologically inert ceramic material, the surface of the plate on the side away from the shaft being provided with a plurality of grooves.

4,287,617

FEMORAL PIN FOR HIP PROSTHESIS

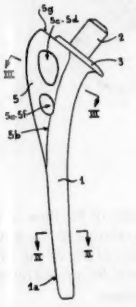
Alain Tornier, Le Brocey-Crolles, France, assignor to Etablissements Tornier, Saint Ismier, France

Filed Oct. 2, 1979, Ser. No. 81,229
Claims priority, application France, Oct. 11, 1978, 78 29595
Int. Cl.³ A61F *1/03*
U.S. Cl. 3—1.913 **4 Claims**

1. In a hip prosthesis of the type having a hilt member for engaging the end of a femur and having a pivot member extending from the hilt member in one direction and having a pin member extending longitudinally from the hilt member in the

other direction and the pin member having a contour curved as viewed in a plane parallel to its longitudinal axis and shaped to fit into the medullary cavity of the femur, the improvement wherein the pin member comprises:

(a) a generally C-shaped member having two opposed similar curved sides lying parallel to said plane, and having first and second sides disposed generally at right angles to said plane, the first side being open to provide a slot extending longitudinally from the hilt member to provide the pin with elasticity transversely of said plane; and



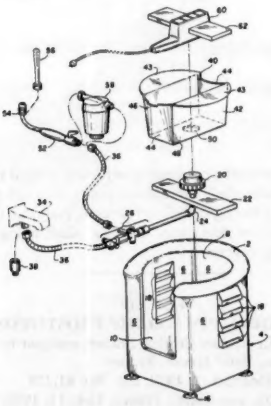
(b) a crest member which is U-shaped in cross section and extends partway along the second side of the C-shaped member from the hilt member and has its free edges joined to the second side of the C-shaped member, said second side of the C-shaped member having a shorter longitudinal slot between said free edges opposite the slot in the first side.

4,287,618

PORTABLE THERAPEUTIC SITZ-BATH, SHOWER AND BIDET COMBINATION

Louis Silver, 5825 Collins Ave., Apt. 15B, Miami Beach, Fla. 33139

Filed Apr. 26, 1979, Ser. No. 33,456
Int. Cl.[3] A47K *7/08, 3/12*
U.S. Cl. 4—443 **4 Claims**



1. A therapeutic device, comprising,

a toilet-type seat,

rigid means for supporting said seat at a comfortable sitting height upwardly of a support surface,

said rigid support means comprising a hollow, open-topped support structure,

a shower head interposed between said seat and said support surface and aligned to discharge water in a substantially vertical direction,

means for bringing said shower head into fluid communication with a source of water under pressure,

open-topped container means removably fitted about said shower head for collecting water flowing therefrom,

said container means having flange means to overlie said toilet seat,

whereby said container means, when filled with water, provides a static sitz bath, and,

whereby said flange engages said toilet seat thereby providing additional support for said container means,

a weir formed on the uppermost portion of said container means to allow overflow of water collected therein so that said water source may continually supply water to said basin thereby providing a dynamic sitz bath,

said support means having an open bottom construction for allowing water discharging from said shower head to flow toward a drain,

said support means having a non-slip interface with said support surface,

whereby the user of said portable device safely employs the same in a bathtub or shower stall environment,

valve means for diverting the flow of water from said shower head to a discharge spout so that the temperature of the water can be adjusted prior to use of said device,

hand held bidet means connected between said water source and said shower head by flexible piping means,

valve means for diverting the flow of water from said water supply to said bidet means,

pressure control means between said water source and said shower head and said bidet means,

whereby the pressure of water flowing into either said shower head or said bidet means is adjustable by the user as desired

said rigid support means having columnar side walls collectively defining an enclosed area,

said toilet-type seat having a generally U-shaped configuration,

one of said sidewalls having an elongate generally U-shaped, in elevational view, cut out portion in registration with the open portion of said U-shaped toilet-type seat so that said cut out portion provides an access opening to facilitate assembly, dissembly, and adjustability of the device whereby a portable sitz shower is provided.

4,287,619

MULTI-PURPOSE CHAIR FOR THE PARTIALLY DISABLED

William R. Brewer, 9100 Bartee Ave., Arleta, Calif. 91331, and Hamilton C. de Jong, 254 S. Berkeley Ave., Pasadena, Calif. 91107

Filed Mar. 19, 1979, Ser. No. 21,919
Int. Cl.[3] A47K *11/04;* **A47C** *7/42, 7/62*
U.S. Cl. 4—483 **13 Claims**

1. A multi-purpose chair for an invalid, comprising

a main chair frame including a seat and left and right pairs of front and rear legs,

guide means forming a vertical guideway between and substantially in the plane of the legs of at least one said pair, such guideway extending downward from substantially the level of the seat,

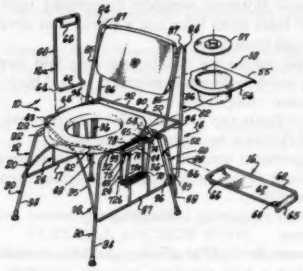
an elongated transfer board slidable in the guideway,

means defining a normal lower position of the transfer board in the guideway such that the upper end of the board projects above the level of the seat and forms an arm rest,

stop means for limiting upward sliding movement of the transfer board,

said stop means including hinge means engageable in said

upper board position for defining a hinge axis about which the board is swingable laterally outward about its lower



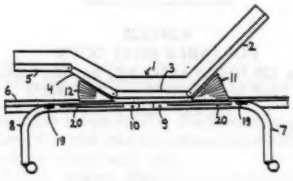
end to a generally horizontal bridge position for forming a transfer bridge extending laterally from the seat.

4,287,620

MULTI-FEATURE AND VARIABLE FUNCTION BODY SUPPORTING ASSEMBLY AND SIDEGUARDS

Henry C. Zur, 10 W. Griswold Ave., Phoenix, Ariz. 85021

Filed Jun. 2, 1978, Ser. No. 911,749
Int. Cl.³ A61G 7/10; F01B 21/00
U.S. Cl. 5—68 **26 Claims**



1. A adjustable body support assembly composed of six or more pivotally connected support panels, adjustable in relation to each other and provided with power means and or locking mechanisms such as pivotally mounted rotating bars serving to hold two or more supports support panels in fixed relationship, and wherein said body support panels form a body support area serving for the adjustable positioning with the support panels forming into transverse divisions and or longitudinal division and wherein alternatively raised portions of the subdivided transverse divisions formed by two or more support panels can provide longitudinal divided supports and serve for other purposes such as providing a turning movement to an occupants body or such as restraining the sideward movement of body portions.

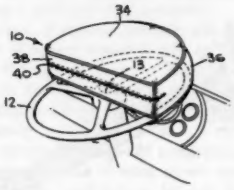
4,287,621

STEERING WHEEL ATTACHMENT

Charles A. Kertz, Egg Harbor, N.J., assignor to Susanna A. Kertz, Egg Habor, N.J.

Filed Jan. 31, 1980, Ser. No. 117,298
Int. Cl.³ A47C 70/02; B60R 21/00
U.S. Cl. 5—440 **3 Claims**

1. A steering wheel attachment comprising a cushion body shaped to overlie a portion of a steering wheel of a vehicle, a cover enclosing said cushion body and a mounting means on said cover dimensioned to snugly fit over a steering wheel for mounting and restraining said cover and cushion body on the upper face of such steering wheel, wherein said cushion body comprises a foam pad having periphery formed of a cylindrical surface of approximately 180° degrees peripheral extent and a planar diameter surface extending between the end terminations of said cylindrical surface, an upper planar surface and a lower planar surface and additionally including a stiffener panel having a periphery contiguous with the periphery of said foam pad, said stiffener panel being positioned adjacent said



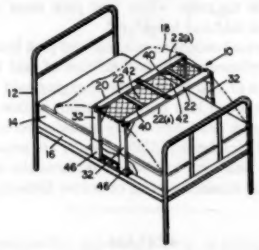
lower planar surface inside said cover for preventing deflection of said foam pad beyond the plane of the upper surface of said steering wheel and wherein said stiffener panel periphery additionally includes a cut-out portion for precluding the application of force to the horn button of said steering wheel by said stiffener panel.

4,287,622

BED COVER HOLDER AND SERVING TRAY COMBINATION

Emma J. Lane, 1430 Ocean Ave., Brooklyn, N.Y. 11230

Filed May 29, 1980, Ser. No. 154,299
Int. Cl.³ A47C 21/02
U.S. Cl. 5—505 **6 Claims**



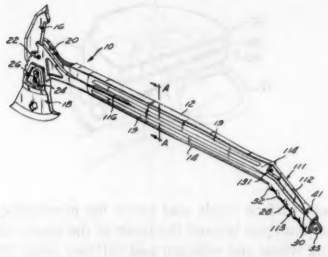
1. Combination bedcover holder and upright serving tray comprising an openable, adjustable frame adapted to be removably attached to the sides of a bed wherein said frame further comprises a pair of elongated, longitudinal, parallel opposing flat top members, each said top member in turn being further divided into substantially equal halves forming a pair of sub-members, each said pair of sub-members being adapted to be openably closeable by means of associated pivoting hook and slot therefor in each respective sub-member, said top members being hingedly connected at each longitudinal end thereof to a vertically extending flat support member having the same width as its top member counterpart, a pivoting truncated triangular stop being provided on the inside of each corner formable by the hinged connection of said top members and vertically extending support members, said stops being pivotally joined along one edge thereof to the underside of its respective sub-member, said stops acting to support said top members, said top members being further supported by the provision of a pair of parallel opposing flat struts, one strut each between each said pair of sub-members.

4,287,623

EMERGENCY RESCUE AXE DEVICE

Phil K. Tarran, Oceanside, Calif.

Filed Mar. 23, 1979, Ser. No. 23,318
Int. Cl.³ B25F *1/02*
U.S. Cl. 7—158 **80 Claims**



1. In a combination tool kit, including an axe head mounted upon an elongated axe handle and a pick head mounted upon an elonged pick handle, wherein said pick head is mountable to said axe head by means permitting said axe head and axe handle and said pick head and pick handle to be used (a) independently of each other, (b) as a composite structure (c) sissored relative to one another and (d) oriented in an end-for-end, substantially linear, configuration, said combination tool kit comprising:

(a) a recess in said axe head having a fixed pivot pin for releasably pivotally mounting said pick head;

(b) a lock means rotatably mounted upon said axe head for movement wherein a portion of said lock means selectively extends within said recess so that said lock means locks said axe head and axe handle and said pick head and pick handle together when said pick head is pivotally mounted on said axe head; and

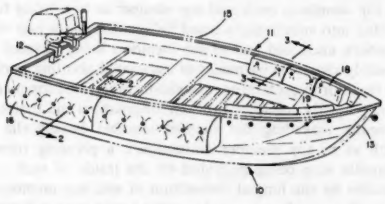
(c) lock apperture means formed on said pick head, having a shape complimentary to said portion of said lock means, said portion of said lock means engaging said lock apperture means when said portion extends within said recess when said pick head is pivotally mounted on said axe head so that said pick head and pick handle are securely locked to said axe head and axe handle without the use of auxiliary tools or mounting bolts or screw fastners.

4,287,624

AUXILIARY FLOTATION GEAR FOR FISHING BOATS

Lou Y. Lowther, San Antonio, Tex.

Filed Feb. 14, 1979, Ser. No. 11,797
Int. Cl.³ B63B *35/00*
U.S. Cl. 9—1.1 **1 Claim**



1. Auxiliary floating gear for a fishing boat having a hull comprising:

a. right and left elongated stern flotation wings adapted to be securely attached exteriorly adjacent the stern of said boat, said wings comprising rigid expanded plastic foam inner filler and a fabric float cover encasing said rigid foam filler;

b. right and left bow flotation members adapted to be securely attached interior and adjacent the bow of said boat, said bow flotation members comprising rigid expanded plastic foam inner filler and a fabric float cover encasing said rigid foam filler;

c. securing means for rigidly attaching said stern flotation wings and bow flotation members to said boat, said securing means comprising:

(1) an adhesive to be positioned between said wings and said flotation members and said boat;

(2) a grommet secured to said fabric float cover;

(3) a float sleeve projecting through said expanded rigid foam filler;

(4) a bolt projecting through said grommet and said float sleeve;

(5) means for rigidly affixing said bolt to said boat comprising a bolt shoulder adjacent said boat, a sealing bushing encircling said bolt adjacent said bolt shoulder, a washer encircling said bolt adjacent said boat hull, and a nut threadably engaging said bolt thereby securely affixing said bolt to the structure of said boat;

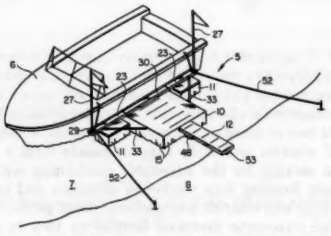
said right and left stern flotation wings being a substantially triangular construction, the height of said triangle following the contour of the hull of the boat adjacent the stern of the boat, the base of said substantially triangular float wings projecting substantially normal to the hull of said boat, and said right and left stern flotation wings being secured above the normal water line of the boat and projecting outward substantially normal to the hull of said boat.

4,287,625

PORTABLE BOAT DOCK

Max Dawson, 120 Hidden Valley Rd., Bayside, Calif. 95524

Filed May 11, 1979, Ser. No. 38,071
Int. Cl.³ B63B *17/00*
U.S. Cl. 9—1.6 **4 Claims**



1. A boat dock assembly comprising:

(a) a main dock structure having a top side, an underside and a block of rigid foam material mounted to said underside for providing buoyancy to the dock structure;

(b) a pair of elongated outrigger arrangements adapted to float in water for stabilizing said main dock structure, each of said outrigger arrangements including an elongated rigid arm, means for disengagably connecting one end of said arm with said dock structure, a float removably connected to said arm, and an elongated cushion serving as a bumper guard fixedly connected to and extending along one side of said arm, said outrigger arrangements being located on opposite sides of said main dock structure and each of said connecting means including a hinge mechanism which operates in a first way for fixedly connecting its associated arm in an operating position with said dock structure and a second way for pivotally connecting its associated arm with said dock structure such that said arm is pivotally movable about a given axis between its operat-

ing position and a folded-away stored position, each of the said hinge mechanisms also operating in a third way for pivotally supporting its associated arm to said dock structure about a second axis perpendicular to said first-mentioned axis such that its arm is movable between said operating position and a second folded-away stored position;

(c) means disengagably connected between said dock structure and each of said outrigger arrangements for providing reinforcement between the latter and said dock structure; and

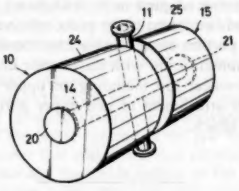
(d) a plank arrangement including an elongated plank and means for disengageably connecting one end thereof to said main dock structure.

4,287,626

FLEXIBLE ANCHOR BUOY

Jun Mito, Hiratsuka, Japan, assignor to The Yokohama Rubber Co., Ltd., Japan

Filed Feb. 12, 1979, Ser. No. 11,563
Int. Cl.³ B63B *21/52*
U.S. Cl. 9—8 R **10 Claims**



1. A flexible anchor buoy comprising:

a tube for the passage therethrough of a chain connected to an anchor,

an elongate core means fixed at a substantially central position thereof to said tube and extending substantially perpendicularly to said tube, and

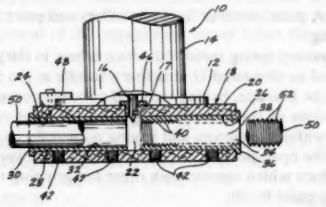
a pair of thick resilient buoyant bodies mounted on and around said elongate core means at opposite sides respectively of said tube and extending substantially from said tube to the respective ends of said elongate core means, said buoyant bodies having axial bores to receive said elongate core means to mount said buoyant bodies on said core means and being separated from said tube for flexing independently of said tube.

4,287,627

METHOD AND MEANS FOR THREADING DOWELS

Bruce J. Chambers, 437-26th St. S.E., Cedar Rapids, Iowa 52403

Filed Mar. 19, 1980, Ser. No. 131,700
Int. Cl.³ B23G *1/00*
U.S. Cl. 10—88 **6 Claims**



1. A dowel threading device, comprising the combination of a router having a horizontal base, a power means on said base, and a vertically disposed sharp cutting bit connected to said power means and with a lower end thereof protruding through an aperture in said base, and a dowel threading attachment, comprising,

a base member detachably secured underneath the base of said router, said base member having a vertically disposed bore adapted to receive the lower end of said cutting bit,

first and second longitudinally aligned horizontal bores extending inwardly into said base member and communicating with said vertically disposed bore,

said first bore being of uniform diameter and being adapted to receive an elongated dowel having an outer diameter substantially the same as the inner diameter of said bore,

said second bore having a diameter slightly less than the diameter of said first bore, with threads being imposed in said second bore,

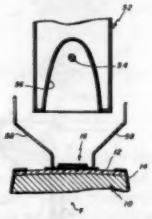
said cutting bit having its lower end terminating at the level of said threads so that a rotating dowel having threads imposed therein by said cutting bit can be threadably received by said threads in said second bore.

4,287,628

APPARATUS FOR STIFFENING SHOE INSOLES

Leo F. Stanton, Newburyport, Mass., assignor to Bush Universal, Inc., Woburn, Mass.

Filed Dec. 12, 1978, Ser. No. 968,830
Int. Cl.³ A43D *31/00*; A43B *13/42*
U.S. Cl. 12—40.5 **12 Claims**



1. An apparatus for applying a strip of activatable, curable material to a surface of a shoe assembly to form a stiffener in situ on the surface, the strip being flexible and deformable prior to curing thereof, said material being curable in response to radiation of a predetermined character, said apparatus comprising:

means for retaining the strip in a predetermined position on said surface of said shoe assembly and for urging the strip into engagement with the surface, said retaining means being constructed and arranged so as to expose a substantial portion of the strip thereby to enable the strip to be exposed to said radiation;

radiant energy means for generating said radiation for activating the strip while the strip is retained in said position on said surface;

presser means engageable with a selected portion of the strip for overlapping an edge portion of the strip and an adjacent region of said surface to press the edge portion of the strip into a tapered, feathered configuration while said strip is retained in said position on said surface; and

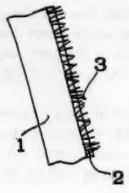
said presser means being constructed and arranged so as not to interfere with the activation or curing of the material.

4,287,629

PROCESS AND APPARATUS FOR THE PRODUCTION OF SYNTHETIC CHAMOIS LEATHER FOOTWEAR

Franco Stalteri, Via Francesco Crispi 44, 91025 Marsala, Italy

Filed Nov. 14, 1979, Ser. No. 94,164
Claims priority, application Italy, Jul. 31, 1979, 68588 A/79
Int. Cl.[3] A43D *9/00*; A43B *23/16*
U.S. Cl. 12—142 R 5 Claims



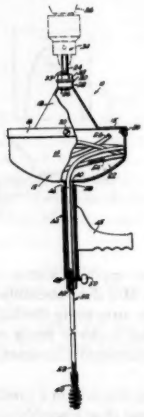
1. In a process for the production of synthetic chamois leather footwear, wherein uppers are produced by injection molding or pouring and a sole is attached to the uppers, the improvement comprising, after attachment of the sole, coating the uppers with a thin layer of adhesive and then flocking the uppers with rayon flock of a count of less than 1 denier and a fiber length of less than 1 mm.

4,287,630

PIPE CLEANING APPARATUS

Thomas Perez, 3310 NW. 9 Ct., Miami, Fla. 33127

Continuation of Ser. No. 906,241, May 15, 1978, abandoned.
This application Oct. 22, 1979, Ser. No. 86,991
Int. Cl.[3] B08B *9/02*
U.S. Cl. 15—104.3 SN 1 Claim



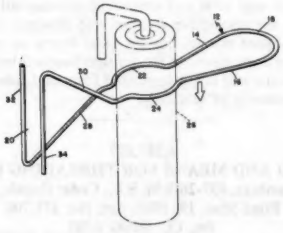
1. An attachment for the chuck of a drill comprising:
a reaming tool, the reaming tool including
a housing defining an interior chamber, the interior chamber having an upper portion and a lower portion,
the upper portion including means exterior of the housing for attaching to the chuck for rotation therewith, and
the lower portion including an open cylindrical axially extending tubular portion of a first predetermined axial length in open communication with the interior chamber, and of a first predetermined inside diameter,
a snake having a first end, an intermediate portion in the interior chamber and a second end extending through the cylindrical tubular portion; the snake being loose in the interior housing and the cylindrical portion, and being of an outside diameter slightly less than said first prediameter, said second end comprising a reaming coil, sleeve means arranged circumferentially about the cylindrical tubular portion having a radially extending hand grip handle; the sleeve means being a shorter length than the cylindrical tubular portion with a portion of the cylindrical tubular portion extending beyond the sleeve means at all times in use, and fastening means to connect the snake axially within the tubular portion for rotation of the snake with the housing and said fastening means being adapted to release the snake for relative axial advancement of the snake relative to the tubular cylindrical portion,
said fastening means comprising a hole in the extending length of said cylindrical member and a screw in threaded engagement in said hole, said screw having an exteriorly accessible portion and said screw having an inner end in engagement with the snake to constrain the snake to rotation with the cylindrical portion on rotation of the housing and being adapted to be withdrawn for axial movement of advancement of the snake relative to the housing,
said upper portion comprising a frustoconical top being in open communication with the interior chamber, and
said frustoconical top including an upper portion having means for attachment of said upper portion for rotation with the chuck.

4,287,631

PAINT REMOVER FOR PAINT ROLLERS AND PAINT BRUSHES

Carl Marrs, 1831 Bonus Dr., San Diego, Calif. 92110

Filed Dec. 31, 1979, Ser. No. 108,505
Int. Cl.[3] A46B *17/06*
U.S. Cl. 15—105 3 Claims



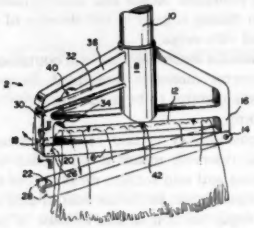
1. A paint remover for paint rollers and paint brushes comprising:
a unitary spring metal rod which is bent in the general shape of an elongated U to define a handle at the closed end of the U-shape, having opposed concave curves in opposite sides of the U-shape for gripping a paint roller inserted within the curves, and having outwardly inclined sides in the open portion of the U-shape with inwardly bent end bars which oppose each other for gripping the bristles of a paint brush;
whereby upon squeezing the handle, the rod squeezes a gripped brush or roller to enhance removal of paint from said bristles or said roller when said brush is pulled from the end bars or when said roller is pulled between the curves of the squeezed rod.

4,287,632

RETAINING MEANS FOR MOP HEAD

Dennis A. Hammond, Ottawa, Canada, assignor to Dustbane Enterprises Limited, Ottawa, Canada

Filed Apr. 3, 1980, Ser. No. 136,499
Claims priority, application Canada, Jan. 18, 1980, 343939
Int. Cl.³ A47L *13/258*
U.S. Cl. 15—150 **12 Claims**



11. In a pivoting jaw retaining means for a yarn-type wet mop head, having a shank for connection to a mop handle, an elongated body secured at its middle to the shank, and a jaw cooperating with and pivoting with respect to the body to releasably grip and retain the mop head yarn between the jaw and the body and release it therefrom, the improvement wherein: the elongated body is provided with opposite, spaced first and second terminal extensions downwardly extending from the ends of the body, one end of the jaw being pivotally secured to the lower free end of the first extension, the other free end of the jaw and the inside surface of the lower end of the second extension being provided with co-operating engagement means releasable upon spacing apart of the lower end of the second extension and the free end of the jaw in a direction generally normal to the direction of rotation of the latter at its closed position, so that, when in engaged position the jaw and the body are in spaced parallel orientation; the second terminal extension also extending upwardly from the corresponding end of the body and being pivotally associated between its ends with the body for outward movement of the lower free end of the second terminal extension away from the jaw, the second terminal extension being associated with the body at a point nearer the upper end of the terminal extension than the lower end thereof, the body narrowing in depth about where it is secured to the second terminal extension to permit the required pivoting of that extension; the retaining means being further provided with a semi-rigid release bar, one end of which bar is attached to the shank at a point spaced from the body, the other end of which bar is attached to the upper end of the second terminal extension,

whereby downward pressure on a part of the release bar between its ends causes deflection of the release bar to pivot the second terminal extension and consequently move the lower end of that terminal extension away from the jaw to release the engagement means when in closed position and permit the jaw to open, and removal of that downward pressure causes the release bar and the second terminal extension to return to original positions to permit re-engagement of the engagement means when the jaw is to be closed.

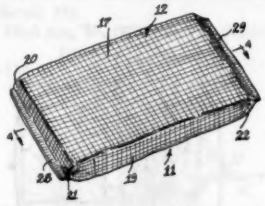
4,287,633

CLEANING PAD

George Gropper, 45-55 Peason St., Long Island City, N.Y. 11101

Filed Nov. 19, 1979, Ser. No. 95,336
Int. Cl.³ A47L *13/16, 17/04*
U.S. Cl. 15—209 B **5 Claims**

1. A yieldable, compact, unitary, pervious, shape-retaining and flexible abrading pad comprising: a main compressed and resilient plastic sponge core body, said body being compressed throughout the full area thereof, and a pervious and abrasive plastic cover forming a tight-fitting against the walls of the said compressed and resilient sponge throughout the full respective areas thereof, said compressed and resilient sponge core body and said tight-fitting cover having corresponding transverse edge areas connected and reduced into strip form for anchorage connection to prevent shifting at such areas between said



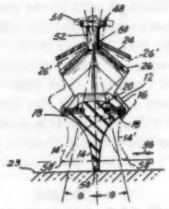
sponge core body and the cover when the pad is in use, the frictional connection between other areas of said sponge core body and said cover also preventing separation thereabout, said cover having top and bottom walls and connecting longitudinal edge areas formed of a continuous knit.

4,287,634

WINDSHIELD WIPER BLADE ASSEMBLY

Peter J. Speth, 239-25 88th Ave., Bellerose, N.Y. 11426

Filed Jul. 28, 1980, Ser. No. 172,881
Int. Cl.³ B60S *1/38*
U.S. Cl. 15—250.42 **8 Claims**



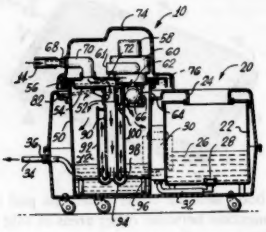
7. A windshield wiper blade assembly including a flexible wiper blade element of extended length and having a flexible support, a pair of secondary yokes connected to said flexible wiper element and support, a primary yoke extended between said pair of secondary yokes, said primary yoke being connectable to an arm for driving said windshield wiper blade assembly across a windshield, the improvement therein comprising:

means for connecting said primary yoke to said pair of secondary yokes, said means for connecting including a portion wherein said primary yoke moves relative to said secondary yokes without disengagement, and another portion wherein said primary yoke is separable from said secondary yoke, said primary yoke remaining engaged with said secondary yokes when said flexible wiper blade element and said flexible support are flexed toward said primary yoke, said primary yoke and said secondary yokes moving relative to one another to permit disengagement of said primary and said secondary yokes when said flexible wiper blade element and said flexible support are flexed away from said primary yoke, said yokes including a V-shaped cross-section, the V-cross-section of said secondary yokes including smaller angles then said primary yoke and nesting within said primary yoke, the apex of each said secondary yoke contacting and pivoting on the apex of said primary yoke, whereby symmetrical pivoting about the apexes is provided during sweeps over said windshield.

4,287,635
WET AND DRY VACUUM CLEANER

Paul G. Jacobs, 9958 Amestoy Ave., Northridge, Calif. 91325

Filed May 7, 1979, Ser. No. 36,295
Int. Cl.³ A47L 7/00
U.S. Cl. 15—321 6 Claims

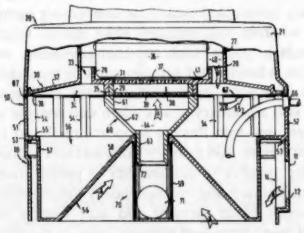


1. A vacuum cleaner for vacuum cleaning wet or dry surfaces, said vacuum cleaner comprising:
a support structure;
an open top recovery tank for receiving soiled material removed from said surface, said tank being releasably mounted in said structure;
a cover on said tank hinged to said support structure and having a seal for cooperating with the periphery of said open top and forming a vacuum chamber in said tank;
a fan mounted on said cover, said fan having an air inlet and an air outlet;
a first passage through said cover placing said inlet of said fan in communication with said vacuum chamber; and
a second passage through said cover, said second passage at one end opening into said vacuum chamber above and geometrically centered over said vacuum chamber and having a means at its other end for connecting to a vacuum conduit through which material removed from said surface moves toward said recovery tank.

4,287,636
APPARATUS FOR CLEANING FLOOR, CARPETS AND THE LIKE

Alan J. Brazier, Birmingham, England, assignor to Vax Appliances Limited, Droitwich, England

Filed Dec. 10, 1979, Ser. No. 101,542
Claims priority, application United Kingdom, Dec. 19, 1978, 49174/78
Int. Cl.³ A47L 7/00
U.S. Cl. 15—321 6 Claims

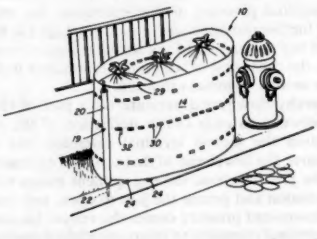


1. Suction cleaning apparatus comprising:
(a) container means for the collection of both wet and dry matter and having an intake inlet for connection with a cleaning head;
(b) motor driven air suction means with an air exhaust outlet and an air inlet;
(c) detachable reservoir means for storing cleaning liquid;
(d) delivery means for delivering said liquid from said reservoir means to said cleaning head in response to the establishment of air pressure within said reservoir means so as to enable the apparatus to be used for wet cleaning;
(e) detachable connector means for connecting said suction means to said container means, said reservoir means and said connector means being interchangeably assembled with said container means and suction means so that the connector means is used in the absence of said reservoir means and vice-versa;
(f) filter means for assembly with said container means when said connector means is assembled therewith so as to enable the apparatus to be used alternatively for dry suction cleaning;
(g) an air passageway in said reservoir means extending, when said reservoir means is assembled with said container means and said suction means, from the interior of said container means to the air inlet of said suction means so as to apply suction to the interior of said container means whilst isolating said air exhaust outlet of the suction means from said container means so that air delivered from said air exhaust outlet enters the reservoir means externally of said air passageway; and
(h) air-flow director means incorporated in said connector means for directing air, when said director means is assembled with said container means and said suction means, from said exhaust outlet of the suction means to atmosphere whilst placing the interior of said container means in communication with said air inlet of the suction means.

4,287,637
TRASH BAG ENCLOSURE

William A. Bernardi, 97 River St., Norwell, Mass. 02061

Filed Nov. 1, 1979, Ser. No. 90,120
Int. Cl.³ E04H 17/00
U.S. Cl. 256—1 7 Claims

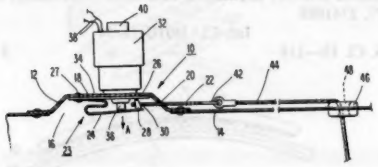


1. A trash bag enclosure comprising:
a sheet substantially rigid in the vertical direction and resiliently windable about a central vertical axis,
said sheet being biased to assume a rolled up configuration about said central axis,
said sheet encircling with a concave surface of said sheet at least one loaded trash bag and being partially rewound to encircle and grip said trash bag with said concave surface in a cooperative relationship with said trash bag,
said sheet having one end portion with means for securing said one end vertically to a fixed location and another end portion free to wind and unwind about said central vertical axis.

4,287,638
INSIDE/OUTSIDE LINK

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 16506

Filed Nov. 29, 1978, Ser. No. 964,655
Int. Cl.[3] E05F *15/2*
U.S. Cl. 16—48.5 28 Claims

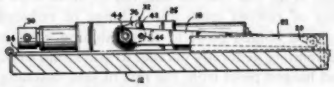


1. A releasing device comprising:
(a) a releasable member;
(b) a substantially dome-shaped, mounting member, said dome-shaped member having a flattened portion at an apex thereof, a concave inner portion and a convex outer portion, said mounting member being adapted for mounting over an aperture in a fluid barrier, and further having an aperture therein for receiving said releasable member, said releasable member being adapted for insertion through said aperture in said mounting member from said outside portion to said inside portion; and
(c) gripping means, mounted on said mounting member for engaging said releasable member when in a normal position after said releasable member has been inserted through said aperture in said mounting member said gripping means further being adapted to release said releasable member when in an activated position, said gripping means further comprising heat responsive means, said heat responsive means being mounted on the inside portion of the flattened portion of said dome-shaped member and further being adapted to cause said gripping means to move to said normal position in response to a preselected ambient temperature and to cause said gripping means to move to said activated position in response to a preselected increase in said ambient temperature.

4,287,639
DOOR CLOSER PERMITTING FREE-SWING AND REGULAR-CLOSER MODES

Arthur M. Denton, Charlotte, N.C., assignor to Scovill Inc., Waterbury, Conn.

Filed Mar. 29, 1979, Ser. No. 24,721
Int. Cl.[3] E05F *15/20, 1/00, 3/04*
U.S. Cl. 16—48.5 6 Claims

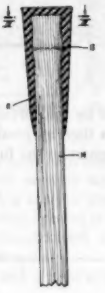


1. An operator assembly for a door closer having a drive shaft comprising:
(a) an operator arm having means at one end to pivotally secure it to the drive shaft and means at the other end to secure it to the door, the arm having a first aperture spaced adjacent the said one end;
(b) a drive plate having means to rigidly secure it to the shaft in a plane perpendicular to the shaft and adjacent the arm, the plate having a pair of spaced apertures, the said spaced apertures and the first aperture being equidistant from the axis of the shaft;
(c) pin means adapted to be selectively received into one of the spaced apertures on the plate and selectively into the aperture on the arm or in abutting relation with a side of the arm adjacent the aperture on the arm.

4,287,640
TOOL HANDLE AND METHOD OF MAKING SAME

Bob N. Keathley, Bernie, Mo., assignor to IXL Manufacturing Co., Inc., Bernie, Mo.

Filed Aug. 17, 1979, Ser. No. 67,260
Int. Cl.[3] A47B *95/02*
U.S. Cl. 16—110 R 17 Claims



17. An elongated axe handle for an axe head having an eye for the reception of a handle, said axe handle comprising:
(a) a solid wood shaft member having a tool end portion, a butt end portion, and substantially the same cross section along the entire length of the shaft,
(b) a molded, axe head holding section molded directly to the wood at the tool end portion,
(c) said axe head holding section being composed of a high impact material and including an outer surface profile effective to slidingly receive and secure an axe head in place on said axe head holding section,
(d) said head holding section including a volumetric mass of material which gives off an amount of heat in its molten condition effective to drive moisture out of kiln dried wood,
(e) the wood of said shaft member has an amount of moisture sufficient to maintain the natural handle strength characteristics of the wood, and
(f) the combination of the wood shaft member and axe head holding section being effective to substantially reduce the size of the wood blank from which the wood shaft member is obtained when compared to the size of the wood blank of a conventional wood handle.

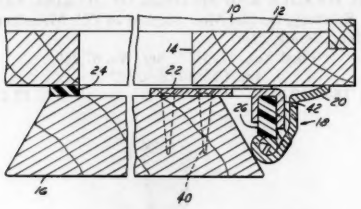
4,287,641
SELF-CLOSING HINGE

Robert D. MacDonald, Mesa, Ariz., assignor to Masco Corporation, Taylor, Mich.

Filed Aug. 20, 1979, Ser. No. 67,685
Int. Cl.[3] E05D *11/10*
U.S. Cl. 16—139 7 Claims

1. A hinge assembly comprising first and second hinge members, said first hinge member having a hinge pin formation thereon, said second hinge member having a hinge formation thereon receiving said hinge pin formation to pivotally connect said hinge members, said first hinge member having an engageable surface thereon, said surface including a cylindrical portion and a cam portion, and a deformable pressure member compressed between said second hinge member and said engageable surface of said first hinge member, said pressure member providing the sole means of holding said hinge members in assembled condition, said pressure member engaging said cylindrical portion of said engageable surface from the full open position of the hinge members to the near-closed position

thereof and engaging said cam portion between the near-closed and fully closed positions thereof, said cam portion being arranged relative to the hinge axis and said pressure member so



that the force applied by said pressure member passes to one side of the hinge axis thereby producing a torque tending to move said hinge members to the fully closed position.

4,287,642

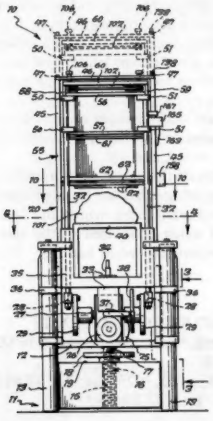
MEAT TENDERIZING APPARATUS

Andre R. Jaccard, 10969 Darien Rd., Holland, N.Y. 14080, and Karl H. Voss, 6781 Ward Rd., Wheatfield, N.Y. 14304

Filed Dec. 28, 1978, Ser. No. 974,032

Int. Cl.³ A22C *7/00*

U.S. Cl. 17—25 **20 Claims**



1. Meat tenderizing apparatus comprising: an assembly comprising a plurality of individual meat-piercing elements; means for supporting and moving a plurality of said elements; means for supporting a cut of meat; means for reciprocating said supporting and moving means toward and away from said meat; individual means for separately guiding each of said piercing elements; separate stripping means carried by each of said guiding means for holding said meat while said piercing elements penetrate said meat and are withdrawn therefrom; each said guiding means being carried by and slidably movable with respect to its associated piercing element.

4,287,643

CARDING ELEMENT

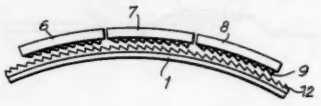
Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trutzschler GmbH & Co., Mochen-Gladbach, Fed. Rep. of Germany

Filed Sep. 8, 1978, Ser. No. 940,658

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741088

Int. Cl.³ D01G *15/84*

U.S. Cl. 19—114 **5 Claims**



1. A carding element comprising: a support member; and a tooth set arranged on said support member and comprised of an alloy of steel-bound hard material containing up to 50% titanium carbide by volume, said tooth set being mounted on said support member in semifinished, machined state and hardened in situ by heating and quenching.

4,287,644

COIL LOOP TYPE CABLE TIE

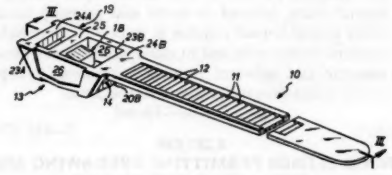
Guy Durand, Montville, France, assignor to Le Grand S.A., Limoges, France

Filed Jan. 28, 1980, Ser. No. 115,747

Claims priority, application France, Jan. 30, 1979, 79 02333

Int. Cl.³ R65D *63/00*

U.S. Cl. 24—16 PB **9 Claims**



1. A cable tie of one-piece construction, comprising a flexible strap having a plurality of lateral ratchet teeth on one side of said strap and a fastening head having a passageway extending parallel to said strap and adapted to receive said strap to form a loop, a hinged pawl having at least one retaining tooth disposed at an end thereof adapted to mesh with any of said plurality of ratchet teeth and a hinge of reduced thickness joining said hinged pawl to said fastening head, said hinged pawl extending generally parallel to said strap, a notch separating said hinged pawl from the rest of said fastening head, said hinge defining the closed end of said notch, and said notch opening outwardly onto a surface of said hinged pawl opposite to a surface on which said retaining tooth is formed.

4,287,645

WAIST BAND FOR PANTS

Pasquale F. Di Costanzo, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

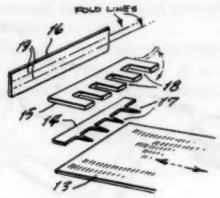
Filed Dec. 10, 1979, Ser. No. 101,681

Int. Cl.³ A44B *9/10, 9/00*

U.S. Cl. 24—301 **2 Claims**

1. A beltless belt, comprising in combination, a length of elastic tape, a metal plate at each end of said tape having a row

of pointed teeth, said teeth of each said plate pointing toward each other, wherein a flexible plastic pad is included at each



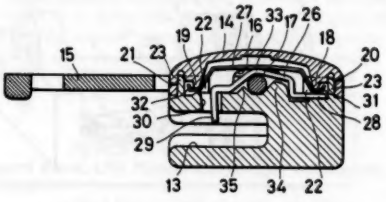
said tape end, said pad having a row of notches along one side aligning with said row of teeth.

4,287,646

AUTOMATICALLY LOCKING SLIDER FOR SLIDE FASTENER

Yoshihiro Kanzaka, Kunugiyama Nyuzen, Japan, assignor to Yoshida Kogyo, K.K., Japan

Filed Feb. 7, 1979, Ser. No. 10,125
Claims priority, application Japan, Feb. 23, 1978, 53-22540[U]
Int. Cl.³ A44B *19/30*
U.S. Cl. 24—205.14 R 2 Claims



1. An automatically locking slider for a slide fastener having a pair of coupling element rows, said slider comprising:

(A) a slider body including a pair of first and second wings defining therebetween a generally Y-shaped guide channel for the passage of said pair of coupling element rows of the slide fastener,

(B) a yoke attached to said first wing,

(C) means attaching said yoke to said first wing, said attaching means comprising a pair of plugs on said yoke and a pair of sockets on said first wing, each of said plugs being fitted in one of said sockets respectively,

(D) a locking member supported on said first wing and having at one end a locking pawl engageable with coupling element rows of the slide fastener in said guide channel and having at the other end a pivot portion disposed in one of said sockets, said locking member being pivotable about said pivot portion,

(E) a resilient member urging said locking member against said first wing to cause said locking pawl normally to project into said guide channel through said aperture, and

(F) a pull tab operatively connected with said locking member for pivotally moving the latter against the bias of said resilient member, to retract said locking pawl from said guide channel into said aperture,

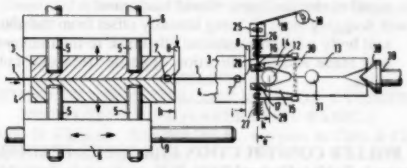
(G) said resilient member comprising a leaf spring having one end portion disposed between one of said plugs and said pivot portion of said locking member to prevent said one of said plugs from coming into contact with said pivot portion, whereby said one of said plugs is protected from abrasive wear by repeated pivotal movement of said locking member.

4,287,647

PROCESS AND APPARATUS FOR MAKING POMPONS

Gerd Rodermund, D-7631 Mahlberg, and Helmut Kappus, Altfelixstrasse 26, D-7630 Lahr, both of Fed. Rep. of Germany

Filed Dec. 27, 1979, Ser. No. 107,561
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1979, 2942492
Int. Cl.³ D04D *7/06*
U.S. Cl. 28—147 16 Claims



1. A process for making pompons, comprising the steps of:

(a) splitting a strip of foil on each side of the longitudinal center thereof in such a manner that a continuous spine with sideways projecting needles is formed;

(b) winding a predetermined length of said split strip on a coiling spindle to form a coil;

(c) fastening the end of said wound strip to prevent said coil from unwinding; and

(d) compression-shaping said coil between two compression members coaxially mounted to said coiling spindle in such a manner that after release by said compression members, the needles spring back into a pompon of predetermined shape.

4,287,648

TIRE BUFFING BLADE

James R. Hineborg, Santa Ana, and Efrain Lopez, Pasadena, both of Calif., assignors to AMF Incorporated, White Plains, N.Y.

Filed Mar. 24, 1980, Ser. No. 133,699
Int. Cl.³ B23D *71/00*; B21K *21/00*; B29H *21/08*
U.S. Cl. 29—79 14 Claims

1. A buffing blade adapted for mounting in a tire rasp, comprising:

a flat planar body with a plurality of pairs of cutting and dragging teeth defining an interrupted convex working edge, and said teeth having a substantially constant radial rake angle which remains unchanged during wear of said teeth;

each of said teeth have straight leading and trailing edges substantially parallel to one another;

a series of primary cutouts separating pairs of cutting and dragging teeth each having a pair of straight diverging sides defined by the trailing edge of a dragging tooth and the leading edge of the following cutting tooth extending from the working edge to the bottom of the primary cutout defining a complex arc;

said teeth having enlarged root portions and said primary cutouts extending below said root portions providing a

heat transfer path from said root portions of each of said pairs of teeth to said planar body between successive cutouts;

a V-shaped cutout between each pair of cutting and dragging teeth having converging sides extending from said working edge to the bottom of said slot defined by the trailing edge of said cutting tooth and the leading edge of said dragging tooth;

said cutting teeth all being laterally offset in the same direction from the plane of said body a distance substantially equal to the thickness of said blade; and

said dragging teeth all being laterally offset from the plane of said body a distance substantially equal to the thickness of said blade and in a direction opposite from said cutting teeth.

4,287,649

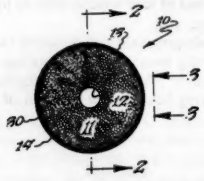
ROLLER CONSTRUCTION FOR PAPER FEEDING

Henry A. Kohler, Orchard Park, N.Y., assignor to Truly Magic Products, Inc., Buffalo, N.Y.

Continuation of Ser. No. 930,933, Aug. 4, 1978, abandoned. This application Mar. 13, 1980, Ser. No. 130,145

Int. Cl.³ B05C *11/02*

U.S. Cl. 29—130 **18 Claims**



1. A paper feeding roller for feeding paper comprising a core of soft resilient material, an annular skin of abrasion-resistant flexible material secured to said core, and an outer surface on said annular skin having depression means therein for causing said outer surface to have a tread for gripping said paper and feeding said paper when said paper is free to move and for accepting air for avoiding planing of said roller when said paper is being fed by said roller and for acting as a lubricant to permit slipping between said paper and said roller in the event said paper is held against movement and for receiving paper particles from said paper, said annular skin being capable of flexing with said core to conform to the surface of the paper against which it is pressed, and said annular skin returning to its original shape upon terminating contact with said paper for ejecting said paper particles from said depression means to thereby produce a self-cleaning action.

4,287,650

UNIVERSAL JOINT OUTER MEMBER

Leslie G. Fisher, Birmingham, England, and John S. Waite, Welshpool, Wales, assignors to GKN Transmissions Limited, Birmingham, England

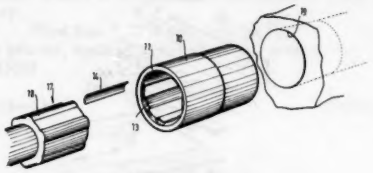
Filed Oct. 22, 1979, Ser. No. 87,281

Claims priority, application United Kingdom, Nov. 1, 1978, 42782/78

Int. Cl.³ B21D *53/12*

U.S. Cl. 29—148.4 R **4 Claims**

1. A method of making a universal joint outer member affording a cavity with axially extending grooves in the wall thereof for receiving balls for torque transmission, comprising the steps of providing at least one element affording groove-defining surfaces, providing an outer member affording a cavity shaped to receive said at least one groove-defining element and of a relatively light weight material permanently deformable by extrusion, introducing said at least one groove-defining element into said outer member, introducing into said outer member a former for determining the final positions of the grooves and dimensions of the cavity, and subjecting this assembly to an extrusion process to form the outer member to



the required size and to secure said at least one groove-defining element therein.

4,287,651

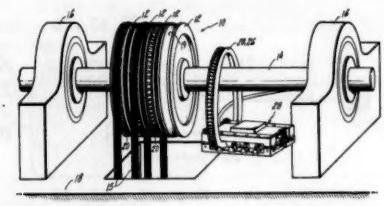
METHOD FOR FABRICATING AND INSTALLING THERMOSET SHEAVE INSERTS

Janis J. Cilderman, Simsbury, Conn., and Joseph G. Kirincich, Saddle River, N.J., assignors to Otis Elevator Company, Hartford, Conn.

Division of Ser. No. 30,986, Apr. 17, 1979, Pat. No. 4,198,196. This application Nov. 1, 1979, Ser. No. 90,186

Int. Cl.³ B21K *1/28*

U.S. Cl. 29—159 R **1 Claim**



1. A method for installing a thermoset plastic sheave insert on a sheave that is mounted on a shaft, comprising the steps:

cutting a premeasured length of insert that is shorter than the circumference of the sheave,

bonding the ends of said length together into a unitized loop around the shaft, including the steps:

colinearly holding said ends together; depositing liquid thermoset material around and between said ends; forcing and holding a mold around said ends for molding said material congruently to the shape of the insert in the space between the ends; heating the mold for curing said liquid; and

stretching the loop around the sheave for installation thereon.

4,287,652

BRAKE SHOE SALVAGING MEANS

Harrison R. Epperly, 8050 E. State Rd., Zionsville, Ind. 46077

Filed Apr. 3, 1980, Ser. No. 136,975

Int. Cl.³ B23P *15/18*

U.S. Cl. 29—233 **10 Claims**

1. A brake shoe salvaging means for removing rivets from a brake shoe table for replacement of the brake lining thereof, the brake shoe table being generally in the form of an arc of a cylinder, to the outer or convex side of which a replaceable brake lining is held by rivet means which extend from the brake lining through holes provided in the brake shoe table in a radial direction with respect to the cylindrical nature of the brake shoe table, the brake shoe salvaging means comprising:

a plate means;

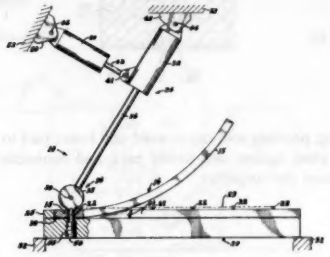
means supporting the brake shoe table and plate means in operative juxtaposition as hereinafter set forth;

the plate means having a pattern of pin means facing the brake shoe table and arranged in a pattern operatively

corresponding to the pattern of rivet holes in the brake shoe table;

the pin means having their outer ends in a plane or in the form of a curved surface whose curvature differs from that of the brake shoe table;

pressure means urging the brake shoe table and plate means operatively toward one another in a forceful manner operative to force the pin means operatively through the



corresponding rivet holes of the brake shoe table to thereby drive the rivets therefrom; and

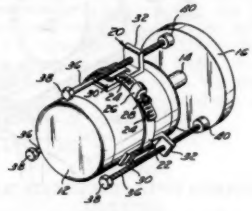
pressure means causing an operative relative rocking of the brake shoe table and the plate means to cause, sequentially or successively, corresponding portions of the brake shoe table rivet holes and pin means to come into the said forceful manner contact, thereby to successively drive from their rivet holes successive ones or groups of the rivets of the brake shoe table.

4,287,653

FORCE APPLYING APPARATUS

Howard Bloch, 1701 Nichols Canyon Rd., Los Angeles, Calif. 90046

Filed May 5, 1980, Ser. No. 146,489
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—256 **2 Claims**



1. In combination with a motor housing, a shaft extending from said motor housing, said shaft to be rotated by a motor mounted within said motor housing, an air movement member mounted on said shaft to be rotated thereby, a tight fit established between said air movement member and said shaft, a force applying apparatus for removing said air movement member from said shaft, said force applying apparatus comprising:

securing means for attachment on said motor housing, said securing means including a flexible band assembly which is to be tightened onto said motor housing;

a bracket assembly connected to said securing means, said bracket assembly comprising a plurality of separate spaced-apart bracket members, said bracket members to be tightly held in position against said motor housing by said band, said bracket assembly being movable along said band when said band is not tightened upon said motor housing; and

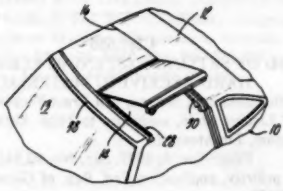
a force applying means connected by connecting means to said bracket members, said force applying means having an outer end and an inner end, said outer end of said force applying means to contact said air movement member, said inner end of said force applying means to engage with a torque applying tool, said connecting means permitting movement of said force applying means relative to said bracket members against said air movement member to cause said air movement member to be separated from said shaft.

4,287,654

METHOD OF MODIFYING THE ROOF OF A VEHICLE TO RECEIVE REMOVABLE ROOF PANELS

Richard R. Chrysler, Brighton, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

Continuation of Ser. No. 885,545, Mar. 13, 1978, abandoned, which is a division of Ser. No. 755,665, Dec. 30, 1976, Pat. No. 4,120,529. This application May 21, 1979, Ser. No. 40,653
Int. Cl.³ B23P *23/00, 17/04;* **B21K** *21/16*
U.S. Cl. 29—401.1 **6 Claims**



1. The method of modifying the roof of a vehicle body to receive detachable panels in which the vehicle body has a roof of rigid material, the steps comprising; cutting the roof of the body transversely from the door space at one side of the vehicle body to the door space at the other side of the vehicle body along transversely extending lines spaced longitudinally of the vehicle body, removing the roof portion between said spaced lines, installing a frame member on the longitudinal center line of the vehicle body and fastening opposite ends of the frame member to the roof of said vehicle body adjacent to said transverse lines, respectively, to form a pair of panel receiving spaces in said body at opposite sides of said frame member.

4,287,655

END EFFECTOR POSITION AND IDENTIFICATION SYSTEM FOR STEAM GENERATOR SERVICING MACHINE

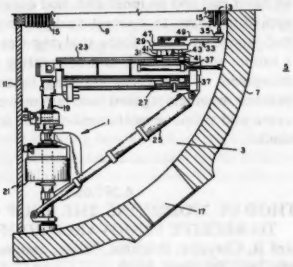
Kenneth S. Gerkey, Mt. Lebanon, and Raymond P. Castner, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1979, Ser. No. 34,312
Int. Cl.³ B23P *15/26;* **B23Q** *21/00*
U.S. Cl. 29—407 **8 Claims**

1. Apparatus for servicing a steam generator tubesheet in which an end effector is mounted on the free end of a support member cantilevered, at selected angular positions in a plane parallel to the tubesheet, from a platform member of a carriage movable along an arm which rotates in a plane which is also parallel to the tubesheet, the improvement comprising:

signal generating means comprising at least two sensor elements mounted on one of said members, each of said sensor elements being operative to generate an electrical signal when triggered, and at least two trigger elements mounted on the other member, each of said trigger elements being operative to trigger a sensor element when aligned therewith, said sensor elements and trigger ele-

ments being arranged on the respective members to generate, through the alignment of trigger elements with selected ones of said sensor elements, a discrete pattern of electrical signals for each of a plurality of angular positions of the cantilevered support member on the platform member, and means responsive to said pattern of electrical signals to position said arm and carriage relative to said tubesheet to align the end effector with a selected location on the tubesheet.



4,287,656

METHOD OF SETTING FASTENING ELEMENTS IN A HARD RECEIVING MATERIAL

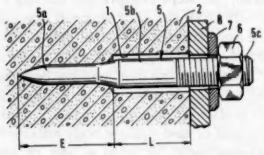
Horst-Detlef Gassman, Schaan, and Ernst Wohlwend, Nendeln, both of Liechtenstein, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Nov. 8, 1979, Ser. No. 92,543

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1978, 2849139

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—432 **6 Claims**



1. Method of setting fastening elements, such as bolts, nails and studs, in a hard receiving matrial, such as concrete and rock, comprising the steps of drilling a blind borehole into the receiving material, aligning an explosive powder-operated setting device containing a fastening element with the blind borehole, and driving the fastening element from the setting device through the blind borehole and into the receiving material.

4,287,657

UPHOLSTERY BUTTON AND METHOD OF ASSEMBLY

Guy Andre, and Gilbert Besson, both of Grenoble, France, assignors to A. Raymond, Lorrach, Fed. Rep. of Germany

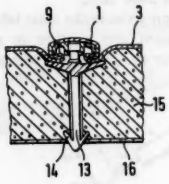
Filed Oct. 22, 1979, Ser. No. 86,790

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1978, 2845939

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—450 **4 Claims**

4. The method of assembling an upholstery button to a cover fabric, comprising the steps of depositing the cover fabric on a die having a die opening, positioning a cap of the upholstery button with its top side on the cover fabric and moving said cap and cover fabric into the die opening to form an arcuate pleat in said cover fabric extending inwardly of said rim of said cap, positioning a lower part of said upholstery button under slight pressure on said cover fabric around the rim of the die opening, pressing said cap toward said lower part to clamp said fabric pleat against said lower part, and connecting said cap and lower part together.



4,287,658

APPARATUS FOR MAKING HEAT-INSULATED STRUCTURAL SECTION ASSEMBLIES

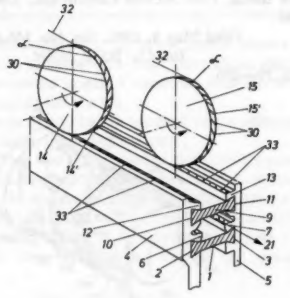
Rudolf Egerer, Bellengerg, Fed. Rep. of Germany, assignor to Wieland-Werke Aktiengesellschaft, Ulm, Fed. Rep. of Germany

Filed May 15, 1979, Ser. No. 39,401

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825301

Int. Cl.³ B21D *39/00*; B23K *25/00*; B23P *19/04*

U.S. Cl. 29—509 **4 Claims**



1. Apparatus for making a heat-insulated structural section assembly consisting of at least two spaced facing structural metal sections transversely connected to each other by at least one heat-insulating bar having end portions retained in cavities defined by inwardly directed flanges on said spaced facing metal sections, said apparatus including at least one pressure roller for applying pressure against a flange on the structural section in order to hold the heat-insulating bar firmly in place within the respective cavity, each said pressure applying roller being rotatable to make rolling contact with the section assembly as said assembly travels through the apparatus and having a plurality of oblique substantially parallel grooves formed in the rolling surface thereof, each said groove having a longitudinal axis disposed at an acute angle with respect to the plane in which said roller rotates and being disposed in such manner that the acute angle faces forwardly and outwardly from the cavity when moving into rolling contact with the flange.

4,287,659

METHOD AND APPARATUS FOR EXCHANGING TOOLS IN HOBBING MACHINES

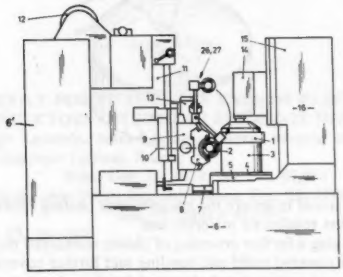
Manfred Erhardt, Puchheim; Werner Fendt, Munich, and Manfred Huber, Germering, all of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,214

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1978, 2818018

Int. Cl.[3] B23Q *3/157*

U.S. Cl. 29—568 14 Claims



1. A method for the automated tool exchange in hobbing machines having means facilitating an automatic sequence of operation for any desired number of workpieces, comprising the steps of moving only a first of said gripping devices at one point on the path of movement along the shaft into the region of a cutter which must be exchanged, a second of said gripping devices remaining stationary during the aforesaid movement of said first gripping device, gripping the cutter which must be exchanged with said first gripping device and removing the cutter from the cutting position, adding a new cutter at a loading point to said second one of said gripping devices which grips same therein, moving said first and second gripping devices together along the length of said shaft and thereafter moving only said second gripping device with said new cutter therein to said cutting position whereat said new cutter is released by said second gripping device, said first gripping device simultaneously carrying said cutter which must be exchanged to a location for removal thereof from said first gripping device, clamping said new cutter into said cutting position, and releasing the grip between said new cutter and said second gripping device to enable said new cutter to perform a certain number of working cycles.

4,287,660

METHODS OF MANUFACTURING SEMICONDUCTOR DEVICES

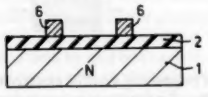
Keith H. Nicholas, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 789,879, Apr. 22, 1977, abandoned, which is a continuation of Ser. No. 574,510, May 5, 1975, abandoned. This application Nov. 24, 1978, Ser. No. 963,546

Claims priority, application United Kingdom, May 21, 1974, 22583/74

Int. Cl.[3] H01L *21/223*

U.S. Cl. 29—571 14 Claims



1. A method of manufacturing a semiconductor device comprising a low resistivity conductive region having a substantially uniform narrow line width, said method comprising the steps of: (a) providing a semiconductor element having an insulating layer disposed at at least a surface part thereof, (b) depositing a layer of relatively high resistivity polycrystalline semiconductor material on said insulating layer, (c) forming a masking layer on a part of the exposed surface of said polycrystalline layer, (d) removing a part of said polycrystalline layer such that an edge thereof is exposed throughout the thickness thereof at an edge portion of said masking layer, (e) diffusing via the exposed edge portion a doping element laterally into a portion of said polycrystalline layer underlying said edge portion of said masking layer in the substantial absence of diffusing said doping element through said insulating layer itself into the semiconductor element, thereby forming said conductive region, (f) removing said masking layer, and (g) subjecting at least a part of the exposed polycrystalline layer adjacent said conductive region to an etching treatment to selectively remove undiffused portions thereof.

4,287,661

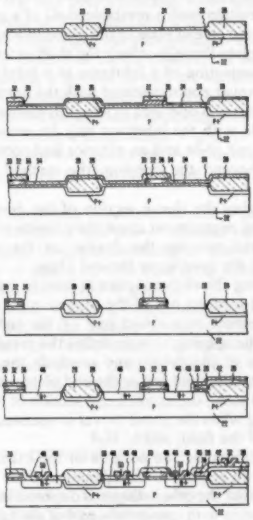
METHOD FOR MAKING AN IMPROVED POLYSILICON CONDUCTOR STRUCTURE UTILIZING REACTIVE-ION ETCHING AND THERMAL OXIDATION

Axel Stoffel, Wildberg, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 26, 1980, Ser. No. 134,039

Int. Cl.[3] H01L *21/20, 21/306*

U.S. Cl. 29—571 10 Claims



1. In a method for making an improved polycrystalline silicon conductor structure in an integrated circuit comprising:

depositing a layer of polycrystalline silicon upon a silicon substrate covered by an insulator coating;

masking the polycrystalline silicon in areas where said conductor structure is desired;

reactive ion etching said polycrystalline silicon in unmasked areas until a thickness of said polycrystalline silicon of the order of hundreds of Angstroms remains on said insulator coating;

thermally oxidizing the unmasked polycrystalline silicon whereby the said thickness on said insulator coating is totally oxidized to silicon dioxide and the exposed side-

wall of polycrystalline silicon located under the mask is oxidized without causing a silicon dioxide wedge formation under the said polycrystalline silicon located under the mask; and

directionally reactive ion etching the said silicon dioxide to remove all silicon dioxide from the horizontal silicon substrate while leaving said silicon dioxide on the vertical said sidewall regions.

4,287,662

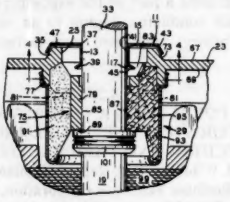
METHOD OF ASSEMBLING

Charles W. Otto, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 889,962, Mar. 24, 1978, Pat. No. 4,198,584. This application Sep. 6, 1979, Ser. No. 73,139

Int. Cl.³ H02K *15/14*

U.S. Cl. 29—596 **16 Claims**



1. A method of assembling a device having a sleeve section integral with a pair of opposite annular slingers in a preselected assembly position onto a rotatable shaft of a prime mover and with respect to an end plate of the prime mover and an opening in the end plate through which the shaft extends so as to preclude contamination of a lubricant in a lubricating system of the prime mover communicated with the opening in the event the prime mover is operated in an environment in which a fluid incompatible with the lubricant may be presented to at least one of the end plate and an exterior end section on the shaft extending beyond the opening, the method comprising the steps of:

(a) arranging the sleeve section of the device generally in gripping engagement about the exterior end section of the shaft and moving the device on the exterior section toward the opening in the end plate;

(b) inserting the sleeve section at least in part into the opening and locating one of the slingers over the opening and with respect to a raised part of the end plate disposed about the opening so as to define the preselected assembly position of the device and preclude the passage of any incompatible fluid across the end plate part into the opening and along the exterior end section of the shaft into the opening when the prime mover is operated in the environment of the fluid; and

(c) predetermining the position of the other slinger on the shaft with respect to the opening and the lubrication system so that the other slinger is disposed in lubricant slinging relation with respect to a part of the lubrication system when the one slinger is located with respect to the raised part of the end plate during the inserting and locating step.

4,287,663

REINFORCED PLASTIC CONTAINER WITH AN INTEGRAL HEATING ELEMENT AND A METHOD OF FORMING THE SAME

Robert W. Newbold, Jr., Cincinnati, Ohio, assignor to Plas-Tanks Industries, Inc., Fairfield, Ohio

Filed Apr. 30, 1979, Ser. No. 34,775

Int. Cl.³ H05B *3/00*

U.S. Cl. 29—611 **13 Claims**

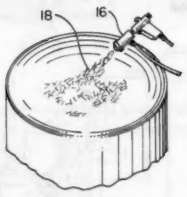
1. A method of making a reinforced plastic container having an integral heating element, comprising:

(a) covering a mold having a container shaped configuration with a first reinforced plastic material;

(b) covering the first reinforced plastic material on the mold with a resin;

(c) placing an electrical heating element which is encapsulated in a plastic material on the resin covered first reinforced plastic material, said encapsulating plastic material being bondable to the first reinforced plastic material;

(d) applying a further covering of resin to both the encapsulating material and the resin covered first reinforced plastic material to secure the encapsulated heating element to the first reinforced material; and



(e) applying a further covering of plastic reinforced material to the covered mold and bonding said further covering to both said encapsulated electrical heating element and to said first reinforced plastic material applied to the mold prior to placement of the heating element, said further covering of plastic reinforced material being applied after the further covering of resin has been applied to both the encapsulating material and the resin covered first reinforced plastic material.

4,287,664

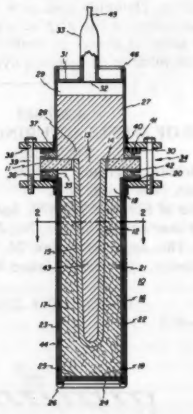
SULFUR ELECTRODE CONTAINER AND METHODS OF MANUFACTURE

Debajyoti Chatterji, Latham, and Dong-Sil Park, Schenectady, both of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 895,141, Apr. 10, 1978, Pat. No. 4,209,573. This application Oct. 22, 1979, Ser. No. 87,402

Int. Cl.³ H01M *2/02*

U.S. Cl. 29—623.2 **6 Claims**



1. A method of producing a sulfur electrode container which consists essentially of providing an outer metallic casing having opposite open ends readily corroded by liquid sulfur, providing a metallic foil substantially corrosion resistant to liquid sulfur, forming the foil into at least two full windings within

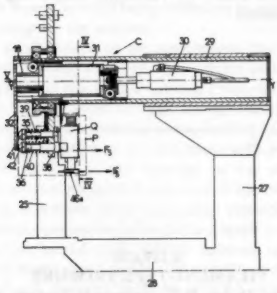
said casing producing a self-sealing protective liner in situ in said casing, said liner being contiguous to and coextensive with the inner surface of said casing, and sealing one open end only of the casing with a metallic end cap fitted within and adjacent said open end of said casing, said end cap having an inner surface substantially corrosion resistant to liquid sulfur.

4,287,665

DEVICE FOR FITTING THE ENDS OF ELECTRICAL CONDUCTORS OR SIMILAR ELEMENTS INTO A BOX

Sergio Leandris, Saint-Sauveur, France, assignor to Precision Mecanique Labinal, France

Filed Oct. 25, 1979, Ser. No. 87,934
Claims priority, application France, Oct. 25, 1978, 78 30352
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—705 **10 Claims**



1. A device for fitting the ends of electrical conductors or similar elements into a box, said device being operated in cooperation with a fixed supply corridor, adapted to feed a succession of suitably orientated boxes, and a transporter of conductors or wires, adapted to bring in a predetermined order a succession of conductors comprising at least one free end, with the free end of each successive conductor in a well-defined position; said device including

a box carrier comprising means for receiving a box from a supply corridor and means for bringing this box into a predetermined succession of well-defined fixed positions, in each of which a well-defined recess or socket of this box occupies a position fixed in space, and means for releasing this box once it is provided with its conductors; and

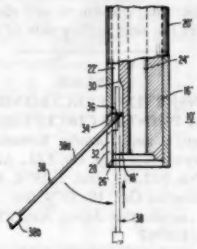
a unit for feeding and plugging in successive conductors or wires comprising grasping means adapted to grasp and release a conductor, means for bringing these grasping means opposite a conductor brought into position by a transporter, means for controlling the grasping of this conductor by said grasping means, means for bringing said grasping means and a conductor grasped thereby opposite said position fixed in space occupied by a well-defined recess of a box held by said box carrier, means for moving said grasping means so as to plug a free end of a conductor held by the grasping means into this well-defined recess and to ensure snap-fitting of this free end into this recess, and means for releasing this conductor from said grasping means.

4,287,666

SIDE-LOADING WIRE WRAPPING ASSEMBLY FOR SEMIAUTOMATIC WIRING MACHINES

George J. Sprenkle, Phoenixville, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 19, 1979, Ser. No. 105,381
Int. Cl.³ B21F *3/00, 15/04;* B23P *19/00*
U.S. Cl. 29—753 **6 Claims**



1. A side-loading wire wrapping assembly for use in a wiring machine comprising:

a generally cylindrical wrapping bit having at its free end a central aperture for receiving a terminal upon which a wire is to be wrapped and a pair of contiguous longitudinally disposed sections for receiving said wire prior to the wrapping operation, a first of said sections having a bore whose central longitudinal axis is offset from that of said wrapping bit, said bore extending from said free end of said wrapping bit a predetermined distance, the diameter of said bore being such that a longitudinal slit leading into said bore is formed in the bit surface, the second of said sections having a groove in said bit surface which is in substantial longitudinal alignment with said slit,

a stationary sleeve substantially enclosing said wrapping bit, said sleeve having a longitudinal V-groove formed in its surface such that the sides of the "V" intersect the respective edges of the slit formed in said bit surface by said bore,

a wire feed hole formed in said sleeve, said V-groove extending from the end of said sleeve adjacent said free end of said wrapping bit and terminating in said wire feed hole, the center of said wire feed hole lying along the central longitudinal axis of said V-groove,

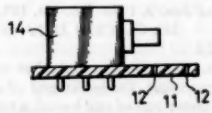
the portion of said wrapping bit appearing adjacent said wire feed hole during the loading of said wire into said wrapping bit having formed therein an opening substantially wider than said slit to provide maximum access to the interior of said bore from said wire feed hole.

4,287,667

METHOD OF MOUNTING AN ELECTRICAL COMPONENT

Masayuki Urushiyama, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1979, Ser. No. 104,817
Claims priority, application Japan, Dec. 20, 1978, 53-15829
Int. Cl.³ H05K *3/34*
U.S. Cl. 29—837 **3 Claims**



1. A method for mounting an electrical component having an operating portion and a plurality of terminals to a substrate

having its surface formed with a printed circuit pattern and formed with apertures for receiving said terminals therethrough, said substrate being provided with a removable portion opposite to an operating portion of the electrical component, the method comprising the steps of:

inserting said terminals of said electrical component through the respective apertures in said substrate,

soldering the terminals extending beyond the rear surface of said substrate by immersion soldering, and

removing said removable portion of said substrate so as to make said operating portion to said electrical component operable from the rear surface side of said substrate.

4,287,668

METHOD OF INSERTING ELECTRONIC COMPONENTS TO A PRINTED CIRCUIT BOARD

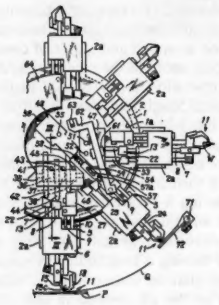
Koichi Asai, Nagoya, and Tousuke Kawada, Chiryu, both of Japan, assignors to Fuji Mfg. Co. Ltd., Aichi, Japan

Division of Ser. No. 912,392, Jun. 2, 1978, Pat. No. 4,197,638. This application Oct. 19, 1979, Ser. No. 86,394

Claims priority, application Japan, Aug. 27, 1977, 52/102880; Sep. 10, 1977, 52/108982

Int. Cl.³ H05K *3/30*

U.S. Cl. 29—838 **7 Claims**



1. A method of inserting by means of a machine lead wires of electronic components into lead wire inserting holes, formed in a large number over a printed circuit board, and fixing them thereto, said method comprising at least one cycle of under-mentioned inserting operations:

a step of expanding the environmental area of targeted holes by pushing away the head portion of an already inserted component or components positioned within the closely neighboring space of said targeted holes, by means of abutting a member movable relatively to said printed circuit board onto said head portion and deforming the lead wires of said already inserted component; and

a step of inserting the lead wires of a component-to-be-inserted into said targeted holes to be fixed there by clinching, whereby the inserting of the lead wires of said components at a high distribution density can be achieved.

4,287,669

GLASS CUTTER

Toshimitsu Arai, 27, 8-chome, Anryu-machi, Sumiyoshi-ku, Osaka-shi, Japan

Filed Jun. 9, 1980, Ser. No. 157,835

Int. Cl.³ C03B *33/12*

U.S. Cl. 30—123.3 **4 Claims**

1. A glass cutter comprising a tubular barrel, a sleeve serving as a cutting oil reservoir, the lower end of said sleeve being capped over the upper end of said barrel, a tubular cutter head coaxially provided under said barrel, a tube immovably fitting in a hollow formed in said barrel but being axially movably fitting in a hollow formed in said cutter head, a bolt threaded into the upper end of said sleeve, said bolt being provided with a longitudinal groove in the threaded shank thereof to admit air, means for resiliently connecting said cutter head to said barrel, a cutting blade provided at the lower end of said cutter head, and a wick fitting closely in said tube with the upper and

lower ends of said wick projecting from the upper and lower ends of said tube, respectively, the lower end of said wick being normally spaced from said cutting blade as long as said barrel and said cutter head are kept away from each other by the bias of said means for resiliently connecting said cutter head to said barrel.

4,287,670

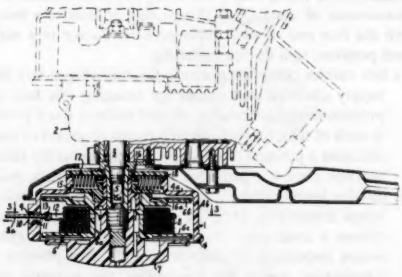
FILAMENT-TYPE TRIMMER

Larry R. Baker, Dallas, N.C., assignor to Textron, Inc., Providence, R.I.

Filed Jul. 28, 1978, Ser. No. 929,026

Int. Cl.³ A01D *50/00*

U.S. Cl. 30—276 **9 Claims**

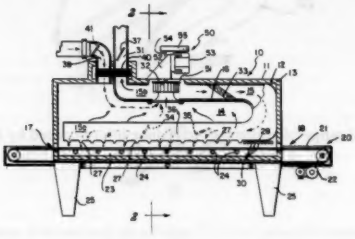


1. In a filament-type trimmer, the combination of a rotatable housing having a rim portion, a filament storage spool rotatably mounted in said housing, a filament wound on said spool, exit means in said rim portion of the housing through which an end portion of said filament extends in passing from said spool to the exterior of the housing, and flexible tubular guide means through which said filament extends in passing from said spool to said exit means.

4,287,671
METHOD OF CURING COATED ARTICLES

Robert L. Koch, II, Evansville, Ind., assignor to George Koch Sons, Inc., Evansville, Ind.

Division of Ser. No. 942,598, Sep. 15, 1978, Pat. No. 4,216,592.
This application Mar. 27, 1980, Ser. No. 134,489
Int. Cl.[3] F26B 3/04, 7/00
U.S. Cl. 34—23 12 Claims



1. A method of curing coated articles within an oven, comprising:

carrying a plurality of coated articles to be cured through an oven with a passage time between the entrance into and the exit from the oven being sufficient to permit curing of the coating on the articles;

creating a circulation of the atmosphere through an open oven portion and a ducted oven portion and directing the atmosphere at the coated articles from the ducted oven portion as they travel through the open oven portion and approach the exit from the oven; heating said circulating atmosphere to produce a temperature sufficient to remove volatile portions of the coatings on the articles as the coated articles progress to the exit of the oven; and

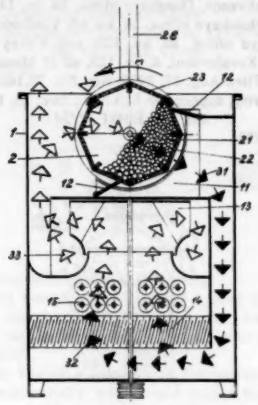
exhausting a portion of the circulated atmosphere through an exhaust opening included in the ducted oven portion as it becomes mixed with volatile portions of the coating material being cured and as said volatile portions exceed a preset level, drawing fresh air into the oven through an oven inlet opening included in the open oven portion to replace the exhausted atmosphere and transferring heat from the exhausted atmosphere to the fresh air being drawn into the oven.

4,287,672
PROCESS AND APPARATUS FOR DRYING PIECES IN BULK IN A PLATING BARREL

Hans Henig, Albrecht-Achilles-Str. 48, 8500 Nünberg, Fed. Rep. of Germany

Filed Arg. 9, 1979, Ser. No. 64,988
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1978, 2836183
Int. Cl.[3] F26B 3/04
U.S. Cl. 34—28 5 Claims

1. A method for drying pieces in bulk consisting of metals and of synthetic materials, by means of an air flow in a rotating barrel which is suitable for the chemical or galvanic surface treatment of said pieces in bulk, wherein said barrel substantially consists of two frontal areas which are perpendicularly arranged to the axis of rotation of the barrel, and a perforated casing which is mounted between the two frontal areas comprising partially filling the barrel with a charge of said pieces, rotating said barrel in one direction only, directing the air by vacuum flow through the perforations of the barrel from substantially the entire outside and along the entire length thereof from the direction of the empty portion of the barrel only which is not in contact with the charge and guiding the flow of air through substantially all of the charge and out of said barrel

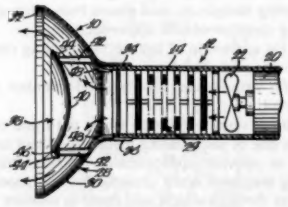


through substantially all and only that part of the perforated casing in direct contact with the charge.

4,287,673
HAIR DRYER DIFFUSER

Gilbert R. Wolter, Elmhurst, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Filed Jan. 11, 1980, Ser. No. 111,413
Int. Cl.[3] F26B 23/04
U.S. Cl. 34—97 4 Claims



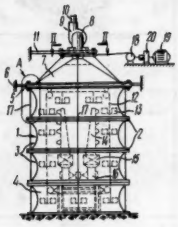
1. A diffuser attachment for a hair dryer comprising a forwardly flared body portion wherein the maximum diameter portion thereof is at its forwardmost edge and having a reduced diameter rear neck portion adapted to be telescopically assembled on the air outlet end of the hair dryer, a diffuser plate concentrically mounted within said forwardly flared body portion with its forward edge spaced rearwardly of said forwardmost edge of said flared body portion and having a convex surface facing the flow of heated air from the hair dryer, the diameter of said diffuser plate being greater than the diameter of said air outlet end of the hair dryer but substantially less than the inner diameter of said flared body portion in a transverse plane defined by the forward edge of said plate whereby an annular gap defined therebetween has a radial dimension in said plane approximately one-fifth of the inner diameter of said flared body portion in said plane, and said forwardly flared body portion having a parabolic configuration with a short cylindrical portion at its forward edge.

4,287,674

DRYING INSTALLATION

Anatoly G. Selivanov, Donskaya ulitsa, 24, kv. 110; Grigory P. Yakovlev, Flotskaya ulitsa, 26, kv. 63; Vladimir I. Khodyrev, Kerchenskaya ulitsa, 20, kv. 120, and Valery V. Zhivetin, ulitsa Sofii Kovalevskoi, 4, kv. 123, all of Moscow, U.S.S.R.

Filed Aug. 27, 1979, Ser. No. 70,146
Claims priority, application U.S.S.R., Dec. 13, 1978, 2691050
Int. Cl.[3] E04H *12/34*
U.S. Cl. 34—201 14 Claims



1. A collapsible and extensible tower for drying comprising:
a sectional-construction defining a folding chamber;
bearing members forming sections of said folding chamber, each having a similar annular shape and vertically arranged one above another;
said sections of said folding chamber, each made up of two bearing members one mounted on the other; said sections adjoining one another being rigidly interconnected
an elastic covering enclosing two axially spaced said bearing members of each said section and secured to two said bearing members of each said section;
said elastic covering being capable of remaining intact under the weight of said the bearing members of folding chamber and those below it;
a hood made fast on a top bearing member of an uppermost section;
a means for holding said folding chamber to a support for depending therefrom, said means being linked to said top bearing member of said upper section;
a means for admission of heat to said folding chamber, situated inside said chamber;
a means for withdrawing air from said chamber, arranged on said hood;
at least three suspension wire ropes with one of their ends held to one of said bearing members of said lower section so as to provide approximately parallel travel of said bearing members when actuated by said ropes;
guideways through which said equal in number to the number of said ropes and located at the places of interlinking of said sections of said chamber.

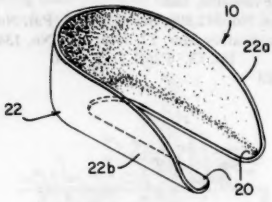
4,287,675

COUNTER FOR ATHLETIC SHOE

Edward J. Norton, Kingston, N.H., and Charles J. Flanagan, Melrose, Mass., assignors to New Balance Athletic Shoe, Inc., Lawrence, Mass.

Filed Jan. 17, 1980, Ser. No. 112,916
Int. Cl.[3] A43B *13/42, 5/06*
U.S. Cl. 36—129 8 Claims

1. For use in footwear, a counter adapted to be mounted on the sole of the footwear within the region of the heel and toward the instep and superposed on the upper of the footwear along a portion of the medial and lateral sides, said counter having a body including a wall which is contoured to extend around the region of the heel and along the sides of the footwear, an upper edge of said wall being of maximum height at the rear of the heel and in the mounted position following a downward inclined generally arcuate path toward the sole, at least the medial side of the body extended to the region of the instep, and said body being formed of a stiff, relatively unyielding material to restrict movement at least of the heel to a



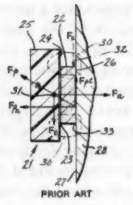
normal range of movement to reduce injury caused by instability.

4,287,676

MAGNETICALLY SECURED DISPLAY APPARATUS

Robert S. Weinhaus, 868 Albey La., St. Louis County, Mo. 63132

Filed May 22, 1978, Ser. No. 908,396
Int. Cl.[3] G09F *3/18*
U.S. Cl. 40—10 R 25 Claims



1. Display apparatus for magnetic securement to a ferromagnetic or paramagnetic object having a smooth surface in lateral displacement resistive relationship thereto, said apparatus comprising a support structure constituted by a sheet of self-supporting material, a display surface presented at the front face of said sheet, magnet means carried at a rear face of said sheet and positioned for developing a force of magnetic attraction to said object with said display surface presented for display purposes, said magnet means comprising a plurality of permanent magnets and means supporting said permanent magnets while permitting movement of said permanent magnets relative to said sheet to permit conformal adapsance and adherence of said permanent magnets to said smooth surface regardless of surface curvature or irregularity, said apparatus including a layer of elastomeric material associated with said magnet means and adapted for being interposed between said magnet means and said object surface with an area of said material maintained in contact with said surface by force of magnetic attraction of said magnet, said material being selected from the group consisting of plasticized polyvinyl chloride, plasticized polyvinyl acetals, and vulcanizing silicone rubber, said area of material magnetically maintained in contact with said object surface developing high intrinsic lateral adherence to said object surface for preventing said apparatus from moving laterally across said surface in response to high forces tending to laterally displace said apparatus.

4,287,677

SET OF SIGNS TO COMPOSE TEXTS IN ARABIC LETTERS BY THEIR JUXTAPOSITION

Joseph Aoun, Beirut, Lebanon, assignor to Lettera Arabica S.a.r.l., Beirut, Lebanon

Filed Jan. 16, 1979, Ser. No. 3,951
Claims priority, application Lebanon, Feb. 7, 1978, 564
Int. Cl.[3] G09F *7/16*
U.S. Cl. 40—595 5 Claims

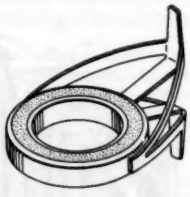
1. A two-dimensional set of signs for the composition by dry transfer of texts in Arabic letters through their juxtaposition which is characterized by the fact that it comprises a sheet of dry transfer material having thereon four kinds of signs; the first ones having the shapes of independent letters; the second ones corresponding to the shapes of the beginning letters provided with a connecting member comprising a protrusion on the visible outline of the letter to connect them to the following sign; the third ones corresponding to the shape of middle letters provided on one hand with a recess in the visible outline of the letter and on the other hand with a said connecting member to connect them to the following sign, and the fourth ones corresponding to the shape of end letters provided with a said recess, said connecting members and said recesses being so shaped as to interfit.

4,287,678

FISHING ROD LINE GUIDE

Shigeru Yamamoto, Higashikurume, Japan, assignor to Daiwa Seiko, Inc., Higashikurume, Japan

Division of Ser. No. 946,278, Sep. 27, 1978, abandoned. This application Apr. 24, 1980, Ser. No. 143,233
Int. Cl.[3] A01K *87/04*
U.S. Cl. 43—24 1 Claim



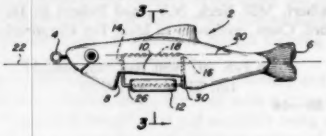
1. A fishing rod line guide comprising:
(a) an inner ring;
(b) an outer ring having a diameter larger than the diameter of the inner ring and disposed concentrically about said inner ring to thereby define an annular space between said inner and outer rings;
(c) a synthetic resin material molded into said annular space between said rings;
(d) the outer surface of said inner ring and the inner surface of said outer ring having concave contours wherein said combination of said inner and outer rings and synthetic resin material molded therebetween prevents said inner ring from slipping out of said outer ring, said combination forming a lightweight shock resistant fishing line guide structure.

4,287,679

ARTIFICIAL MINNOW BAIT WITH SWINGING KEEL WEIGHT

Al Klotz, 131 Dover La., Boise, Id. 83705

Filed Jan. 17, 1980, Ser. No. 113,077
Int. Cl.[3] A01K *85/00*
U.S. Cl. 43—42.09 2 Claims



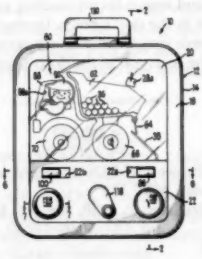
1. An artificial minnow lure comprising:
an elongated buoyant body having spaced head and tail portions and back and belly portions disposed therebetween, said belly portion having a recess therein;
a keel weight;
pivot means, having a pivotal axis, for suspending the keel weight substantially within said recess for side-to-side swinging movement of said keel weight about said pivotal axis of said pivot means which extends lengthwise of the body; and
said body having a center of buoyancy which is disposed generally at the juncture of the belly and back portions, said pivotal axis being disposed above said center of buoyancy.

4,287,680

MECHANICAL ACTION TOY

Robert K. Allen, Cincinnati, Ohio; Alan A. Hicks, Chicago, Ill., and Harry Disko, S. Barrington, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

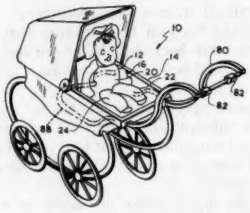
Filed Feb. 8, 1980, Ser. No. 119,885
Int. Cl.[3] A63H *33/00*
U.S. Cl. 46—1 R 22 Claims



1. Toy apparatus comprising:
a housing having a plurality of separate compartments in communication with each other with a first compartment having an exterior wall of light transmitting material for external viewing of the interior thereof;
at least one playing piece adapted to move between said compartments;
a hopper in said first compartment mounted for movement between a first position for holding and receiving playing pieces discharged from a second compartment into said first compartment and a dumping position;
means for moving said playing piece(s) dumped from said hopper through said second compartment for discharge into said hopper in receiving position in said first compartment, said moving means comprises a member mounted for rotation in said housing including a plurality of separate receptacles for containing a playing piece and movable upon rotation of said member from a lower receiving

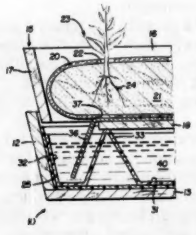
level to an upper discharge level above said hopper and, an intermediate wall for dividing said housing into separate compartments, said intermediate wall positioned to closely face open ends of said receptacle and formed with discharge openings adjacent said upper and lower levels.

4,287,681
TOY DOLL AND ACCESSORY
Judith Albert, Mill Neck, N.Y., and Robert E. Davis, North Branford, Conn., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed Feb. 29, 1980, Ser. No. 126,137
Int. Cl.[3] A63H *29/16*
U.S. Cl. 46—44 **8 Claims**



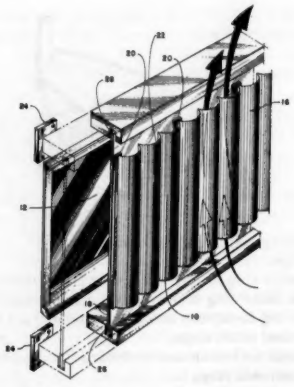
1. A combination doll and accessory comprising a doll body having a torso and at least one articulated limb mounted in the body for movement relative to the body's torso; a pressure responsive actuator in said body connected to said at least one limb for moving the limb relative to the torso upon application of fluid pressure thereto; a flexible fluid reservoir located in said body in fluid communication with said actuator whereby compression of said reservoir will cause application of pressure to said actuator and movement of said at least one limb; said reservoir having an outlet opening to the exterior of the doll's body and valve means for selectively opening and closing said outlet opening; an accessory for said doll including a second fluid reservoir and means for connecting said second reservoir to the reservoir in the doll's body, through said valve means, whereby said limb may be selectively actuated by application of pressure to the reservoir in the dolls's body or to said second reservoir.

4,287,682
PLANTER
Christopher R. Browne, 67-3120 Sheppard Ave. East, Agincourt, Ontario, Canada M1T 3J9
Filed Mar. 7, 1980, Ser. No. 127,957
Int. Cl.[3] A01G *27/00*
U.S. Cl. 47—81 **5 Claims**



1. A planter comprising:
an open top, generally flat, box-like container having a closed bottom and upstanding walls, said container adapted for use as a reservoir for holding liquid, such as water and aqueous solutions of plant fertilizers and nutrients and the like;
a substantially horizontally arranged platform positioned within the container and having support means holding the platform a considerable distance above the bottom of the container, a water impervious plastic bag-liner closely fitted within said container against its bottom and upstanding walls to hold liquid within the container, and said support means comprising a relatively stiff sheet of cardboard-like material having a base portion closely arranged within the container against the plastic bag-like liner to hold the liner against the container bottom and said support means having spaced apart peaks bent up from the base portion for supporting said platform and said support means having bent up end flaps formed on its opposite ends for holding portions of the liner against their adjacent container wall surfaces;
a roughly flat generally horizontally arranged bag of a size to substantially cover the open top of the container, with the bag being pre-filled with a plant growing filler material, such as peat moss, soil compositions and the like;
with said bag being positioned upon and thereby supported by said platform considerably above the bottom of the container while substantially covering the open top of the container, and an upper, box-like frame of approximately the size of said container, said frame supported upon the platform support means and extending a distance above the container for surrounding the sides and ends of said bag;
a capillary type wicking sheet means arranged upon the platform beneath the filler material and having a portion extending beneath the platform into the container for capillary flowing liquid from the container to the filler material; and
with the exposed upper surface of the bag being adapted to be perforated for receiving plants, whereby the roots of the plants extend within the filler material and are watered by the capillary flow.

4,287,683
SOLAR SHIELD
David W. Louwenaar, 1248 Ironton St., Aurora, Colo. 80010
Filed Jan. 21, 1980, Ser. No. 113,958
Int. Cl.[3] E06B *3/32*
U.S. Cl. 49—463 **3 Claims**



1. A solar shield for reflecting and dissipating solar energy before said solar energy enters a room's airspace, comprising:
(a) reflective surface piece having a reflective surface facing the sun,
(b) one or more spacers affixed between the reflective surface piece and a backing piece so that the spacer width

creates and defines the width of a warm air channel between the reflective surface piece and a backing piece,

(c) a backing piece which is slidably attached to a mounting means and which is affixed to the spacer(s) on the side of the backing piece which faces the sun, and wherein said backing piece defines the exterior surface of an edge light space located between said backing piece and a window being shielded,

(d) mounting means for receiving the backing piece and for defining an edge light space between the rear side of the backing piece and the window being shielded.

4,287,684

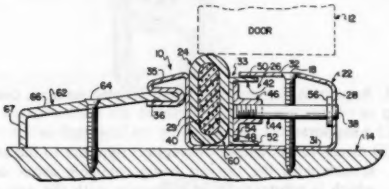
THRESHOLD WITH ADJUSTABLE WEATHER SEAL

H. Smith McKann, Fredericksburg, Va., assignor to General Products Company, Inc., Fredericksburg, Va.

Filed Aug. 15, 1979, Ser. No. 66,813

Int. Cl.³ E06B *1/70*

U.S. Cl. 49—468 **17 Claims**



1. A threshold having an adjustable weather seal, the combination comprising:

a rigid hollow assembly adapted to be fixedly interposed between a door and a floor;

said assembly having an elongated slot,

said assembly having a first stationary member and a second stationary member spaced apart by a fixed dimension, said second stationary member defining one side of said slot;

an elongated elastomeric seal received in said slot with a portion thereof extending above said assembly; and

compression means, located inside said hollow assembly and coupled to said first stationary member, for compressing said seal against said second stationary member to vary the distance said seal extends from said assembly so that said seal contacts the bottom of the door,

said hollow assembly comprising a top wall extending from said first stationary member and defining the other side of said slot,

said compression means comprising an elongated member having a main portion contacting said seal and a top portion extending from said main portion towards said first stationary member and below said top wall.

4,287,685

PAD ASSEMBLY FOR VACUUM ROTARY SANDER

Miksa Marton, 3620 Rankin Blvd., Windsor, Ontario, Canada

Filed Dec. 8, 1978, Ser. No. 967,581

Int. Cl.³ B24B *23/00, 55/06*

U.S. Cl. 51—170 T **3 Claims**

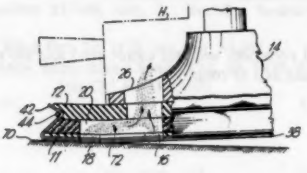
1. A pad assembly for a vacuum rotary sander, said assembly comprising:

(a) a circular upper pad portion of firm but resilient material, having a plurality of evenly spaced apertures concentrically arranged therein and positioned approximately midway between the centre of said upper pad portion and the circumferential edge thereof,

(b) and an elongated channel extending from each said aperture angularly outwardly in the direction of rotation of the assembly, each said channel having an open bottom edge,

(c) a lower pad portion of relatively soft, flexible material and having an inner and outer row of evenly spaced concentrically arranged apertures, each of said apertures extending through a top and bottom surface of said lower pad portion, said top surface of said lower pad portion being bonded to said upper pad portion so that the inner row of apertures in the lower pad portion coincide with the apertures in the upper pad portion to form a plurality of inner vacuum holes and wherein the outer row of apertures on the lower pad portion coincide with outer terminal ends of the channels in the upper pad portion, the material of the lower pad portion intermediate the inner and outer rows of apertures therein forming a flexible bottom wall for said channels,

(d) said upper pad portion having an inwardly and upwardly tapering circumferential side wall with a groove adjacent an upper end thereof, said pad assembly being adapted to receive a sanding disc on the bottom surface of said lower



pad portion, the disc having apertures therein coinciding with those in the lower pad portion and retained thereon by a flexible backing held in the sidewall groove by elastic retaining means,

(e) a circular rigid head member secured concentrically to and on top of the upper pad portion and adapted for connection to rotating and vacuum means, said rigid member having a plurality of apertures therein somewhat larger than, and coinciding with the apertures in the upper pad portion; and

(f) said inner and outer rows of apertures in the lower pad portion are elongated in the direction opposite to that of rotation of the assembly to provide each aperture with a leading and trailing end, the leading end of the inner row of apertures coinciding with the inner ends of the apertures in the upper pad portion and the rigid head member.

4,287,686

CLAMPING APPARATUS FOR CLAMPING CUTTER BLADES OF A GEAR CUTTING MACHINE AT A GRINDING MACHINE

Erich Kotthaus, Wallisellen, and Hans J. Spiess, Zürich, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Mar. 13, 1980, Ser. No. 130,047

Claims priority, application Switzerland, Mar. 27, 1979, 2823/79

Int. Cl.³ B24B *3/02*

U.S. Cl. 51—225 **12 Claims**

1. A clamping apparatus for clamping cutter blades of a gear cutting machine, during the grinding of the cutter blades, at a grinding machine, comprising:

a cutter head in which there is mounted the cutter blades to be ground;

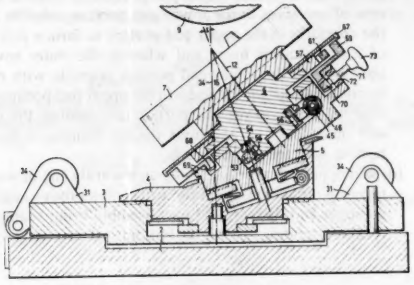
means for mounting said cutter head to be rotatable about a cutter head axis;

means for mounting said cutter head to be pivotable about a pivot axis;

said pivot axis being inclined through an acute angle with respect to said cutter head axis and arranged such that the smallest spacing between the pivot axis and the cutter head axis is located externally of the clamping apparatus;

said clamping apparatus has an axis of rotation which is

inclined at an acute angle with respect to the pivot axis; and



said pivot axis and said cutter head axis are rotatable about said axis of rotation.

4,287,687

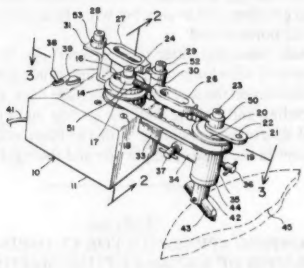
VARIABLE WORK HOLDING DEVICE FOR GRINDING GEMSTONES

Hugh R. Wilson, 10840 SW. 120th St., Miami, Fla. 33176

Continuation of Ser. No. 900,158, Apr. 26, 1978, abandoned. This application Jul. 2, 1979, Ser. No. 53,903

Int. Cl.³ B24B *7/22, 9/16*

U.S. Cl. 51—229 **6 Claims**



1. In an abrading device with a planar abrading surface, a work holding device for grinding gemstones and industrial diamond tools comprising:

(a) a body;

(b) an extension means fixedly mounted on said body and extending from said body on a plane parallel to the plane of said abrading surface;

(c) a rotatable dop holding means adapted for holding a stone bearing dop means, said rotatable dop holding means being moveably mounted on said fixed extension means;

(d) a first and second pulley means, said first pulley means mounted on said body for eccentric movement and said second pulley means mounted on said rotatable dop holding means;

(e) a timing belt adapted to be connected between said first and second pulley means;

(f) a linkage means, said linkage means adapted to be connected between said first and second pulley means; and

(g) said second pulley means including means providing powered movement for said rotatable dop holding means.

4,287,688

APPARATUS FOR GRINDING PLANE, ANNULAR SURFACES, ESPECIALLY ON FAYING RINGS IN GATE VALVES

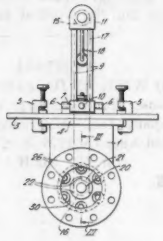
Per Jensen, Moss, Norway, assignor to Rino Solberg, Norway

Filed Nov. 22, 1976, Ser. No. 743,741

Claims priority, application Norway, Nov. 21, 1975, 7[illegible]913

Int. Cl.³ B24B *15/02*

U.S. Cl. 51—241 VS **4 Claims**



1. Apparatus, for grinding plane annular surfaces, comprising:

(i) a support

(ii) means for mounting the support opposite to the annular surface with the support being rotatable about an axis which is substantially in alignment with the axis of the annular surface,

(iii) a plurality of grinding heads carried in freely rotatable manner by said support, said grinding head being rotatable about a respective axis of rotation which is parallel to the axis of rotation of the support, the respective axes pf rotation of the grinding heads being all disposed on a pitch circle concentric with the axis of rotation of the support, the radius of the pitch circle being different from the main radius of the annular surface whereby each grinding head as a result of grinding engagement with the annular surface performs a planatary rotation as the support is rotated, wherein the means for mounting the support comprises:

(a) a multi-part hub having an integral part-spherical bearing surface, said support being mounted on said hub with the axis of rotation of the support coincident with the center of said bearing surface,

(b) a driving shaft having a part-spherical head on which said multi-part hub is engaged by its part-spherical bearing surface, said part-spherical head having in it a diametral opening which increases in cross-section from the center of the head to the periphery of the head, and

(c) an entraining member disposed in said diametral opening and extending radially therefrom at each end to engage into said multi-part hub, whereby the axis of rotation of said multi-part hub may vary, with respect to the axis of rotation of said part-spherical head to the extent permitted by movement of the entraining member within said diametral opening.

4,287,689

METHOD FOR IMPROVING THE QUALITY OF LOW FREQUENCY OUTPUT OF A VIDEO DISC PICKUP STYLUS

Michael J. Mindel, Camby; Michael E. Miller; James C. Rustman, both of Indianapolis, all of Ind., and Richard C. Palmer, Blawenburg, N.J., assignors to RCA Corporation, New York, N.Y.

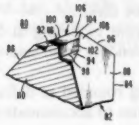
Filed Oct. 30, 1979, Ser. No. 89,479

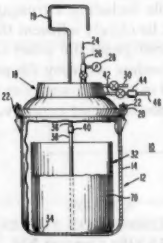
Int. Cl.³ B24C *1/04, 1/08*

U.S. Cl. 51—320 **5 Claims**

1. A method for improving the quality of the low frequency signals recovered by a video disc playback stylus having on

one face of a dielectric support element a deposited conductive metal electrode which comprises the step of directing a suitable abrasive onto the dielectric support element so as to remove metal deposited on non-electrode surfaces.



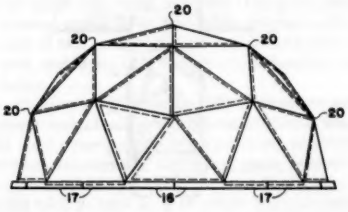


4,287,690

DOMICAL BUILDING STRUCTURE

William R. Berger, 3404 Hawthorne Ave., Richmond, Va. 23222, and Benjamin L. Rose, Jr., 220 W. Main St., Richmond, Va. 23220

Filed Jan. 21, 1980, Ser. No. 113,947
Int. Cl.³ E04B *1/32*
U.S. Cl. 52—81 **8 Claims**



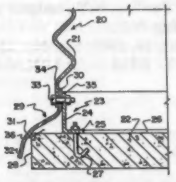
1. A domed structure comprising a base perimeter foundation and a dome positioned thereupon, said dome being comprised of a plurality of triangular panels having a flat outer face and having adjacent each side a flat abutment surface having therein continuous interengaging means in the form of a groove or projection uniformly extending substantially the full length of said side and adapted to insertively mate with a corresponding projection or groove respectively associated with the side of an adjacently positioned interengaged panel in a manner to prevent motion of the interengaged panels in directions perpendicular thereto, said abutment surfaces being disposed below said outer face forming an angle therewith of between about 78° and 86°, the thickness and composition of said panels being selected so as to provide rigidity and thermal barrier characteristics while minimizing weight, and one triangular panel intended for positioning generally adjacent the uppermost portion of said dome as the last panel in the construction thereof, said last panel having interengaging means which do not require insertive mating and being otherwise identical to said plurality of panels, said base perimeter foundation being comprised of a plurality of footings of two different styles, each footing having two opposed straight segments, the length of each segment being half the length of a side of at least some of the panels, the upper portion of each segment being provided with interengaging means of the same general nature as employed in said plurality of panels, the configuration of interengaging means on one segment being the complementary mating configuration of interengaging means of the opposite segment of each footing, the two styles of footings having opposite arrangements of interengaging means in each segment such that, when placed in alternating end to end coplanar abutment to form a closed polygonal perimeter, the footings provide a series of interengaging means of alternating configuration adapted to receive sides of said panels in a manner whereby each side of said panels spans two segments of adjacent footings.

4,287,691

BASE CONSTRUCTION FOR GRAIN BINS AND THE LIKE INCLUDING MOISTURE SEALING MEANS

Bernard Guenther, 117-6th Ave., N., Yorkton, Saskatchewan, Canada

Filed Oct. 15, 1979, Ser. No. 84,667
Claims priority, application Canada, Oct. 20, 1978, 313849
Int. Cl.³ E04D *13/00*
U.S. Cl. 52—97 **4 Claims**



1. A grain bin including in combination a perimetrical wall, a floor including an upper, substantially horizontal surface portion and an outer, substantially vertical perimetrical edge portion, means to secure said wall to said floor adjacent the lower perimetrical edge portion of said wall and water impervious shield means extending from adjacent said lower edge of said wall oer the perimetrical edge portions of said floor and downwardly to cover at least the upper portion of the vertical edge portion of the floor in moisture shedding relationship, said means to secure said wall to said floor including a member extending around said floor adjacent the perimeter thereof, said member including an upwardly extending flange and a horizontal flange, said member being secured to said floor by said horizontal flange and to said wall by said upwardly extending flange, said shield means being secured to said wall outboard of said upwardly extending flange and extending over the perimetrical edge of said floor and downwardly therefrom and including a downwardly and outwardly sloping portion for water shedding action, said sloping portion extending from the junction of said shield means and said wall.

4,287,692

SAFETY APPARATUS FOR A MINING MACHINE

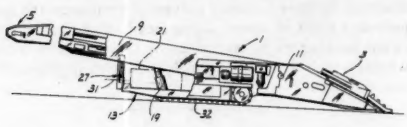
Clifton E. Alexander, Nortonville; Thomas R. Ford, Dawson Springs, both of Ky., and William S. Smith, Collinsville, Ill., assignors to Peabody Coal Company, St. Louis, Mo.

Filed Jun. 12, 1979, Ser. No. 47,717
Int. Cl.³ E04H *12/34*; F16M *13/00*
U.S. Cl. 52—116 **10 Claims**

1. Safety apparatus for a mining machine having a frame and an elongate structure pivotally mounted for swinging movement on the frame about a horizontal axis extending transversely of the macine, hydraulic lift means between the frame and said pivoted elongated structure for raising and lowering it, access being provided between the frame and said structure when said structure is raised for personnel servicing machine

components underneath said structure; said safety apparatus comprising:

a pair of struts each pivotally mounted on the frame for pivotal movement about an axis extending in a longitudinal plane of the machine between a lowered storage position in which the strut extends outwardly toward but no farther than one side of the frame and a raised supporting



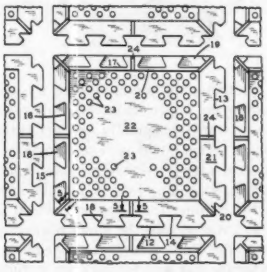
position, the upper end of each strut, when in supporting position, being engageable by said elongate structure so that, if hydraulic pressure to the lift means is lost during servicing of the machine components underneath said structure, downswing of the elongate structure and thus injury to personnel servicing the machine components is prevented.

4,287,693

INTERLOCKING RUBBER MAT

Roderick E. Collette, Pawling, N.Y., assignor to Pawling Rubber Corporation, Pawling, N.Y.

Filed Mar. 26, 1980, Ser. No. 134,057
Int. Cl.³ B32B *3/10*; E04C *1/10*
U.S. Cl. 52—177 **3 Claims**



1. A ventilated, interlocking floor tile, which comprises

(a) a lower layer including a heavy, substantially solid edge region, the periphery of said edge region being provided with a plurality of interlocks to interconnect said tile with contiguous tiles whereby a floor surface covering can be constructed,

(b) said interlocks comprising dovetail projecting elements extending from said edge region and alternating dovetail slots formed thereby,

(c) said projecting elements interlocking with adjacently positioned dovetail slots of a contiguous tile,

(d) said lower layer including an inner region formed by said heavy, substantially solid edge region and defining a cavity,

(e) said heavy, substantially solid edge region including a plurality of ventilating grooves extending from the cavity to the edges of said floor tile to accommodate the flow of air to and from said cavity, and

(f) an upper layer joined with said lower layer and forming an upper floor surface,

(g) said upper floor surface including a unidirectional slip-resistant tread pattern,

(h) said upper layer being secured to said lower layer such that said upper layer overlies the projecting elements of two predetermined sides of said substantially solid edge region of the lower layer, whereby the remaining exposed projecting elements may only interlock with the dovetail slots defined by the covered projecting elements of a contiguous tile thereby maintaining uniformity in the pattern defined by the unidirectional tread patterns of said upper layer throughout the floor surface covering constructed from said floor tiles,

(i) said heavy edge region including at least one corner ventilating groove extending from said cavity to the tile corner,

(j) said tile corners being rounded to define an open space between contiguous tiles to accommodate the flow of air to and from said cavity,

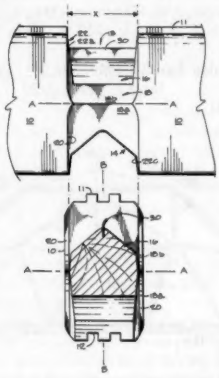
(k) each of said projecting elements positioned adjacent the corners of each tile including a truncated side arranged and configured to lie closely adjacent the corner ventilating groove of a contiguous tile when said tiles are in an interlocked relationship, whereby the projecting element may be positioned in close proximity to the corner of said tile while accommodating said corner ventilating groove.

4,287,694

CORNER JOINT FORMATION FOR BUILDING LOG

G. Howard Cornell, 4315 Villa Crescent NW., Calgary, Alberta, Canada

Filed Jul. 17, 1979, Ser. No. 58,412
Int. Cl.³ E04B *1/10*
U.S. Cl. 52—233 **3 Claims**



1. In a building log having opposed side faces and upper and lower horizontal edges;

a joint formation for making a corner joint with an identical joint formation of a mating log, said formation including a neck joining parts of said log on opposite sides of notches in the upper and lower edges of said log, said neck being in part defined by said notches and in part by side surfaces recessed within the side surfaces of the log, and said notches being surrounded by an outer shoulder,

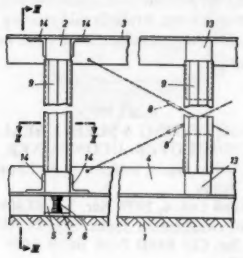
wherein flank areas of the notches within said outer shoulders are sloped at a small angle from a plane normal to the log axis so as to converge towards the centre of the log, and the neck side surfaces adjoining said notches also slope at a similar small angle to a vertical medial plane of the log so as to converge upwardly and downwardly from a horizontal medial plane of the log, whereby said converging surfaces of the flanks and neck sides can mate with similarly sloping neck and flank surfaces of said mating log, and wherein the top and bottom of said neck are arranged to provide a clearance space with the adjacent parts of said mating log when fitted together.

4,287,695

PREFABRICATED BUILDING

Alois Höfler, Walding, Austria, assignor to Lifehaus Corporation of Texas, New Braunsfels, Tex.

Filed Apr. 13, 1979, Ser. No. 29,635
Claims priority, application Austria, Jun. 19, 1978, 4426/78
Int. Cl.[3] E04H 1/00
U.S. Cl. 52—241 2 Claims



1. An outer wall of a prefabricated building affixed to a foundation, which comprises:

(a) a load-carrying steel skeleton frame extending in a vertical plane and comprising

(1) a plurality of upright steel columns spaced apart in said plane, each column being of substantially square horizontal cross section, and

(2) an upper steel beam coupled to the upper ends of the columns and a lower steel beam coupled to the lower ends of said column to form the skeleton frame therewith, said lower steel beam being anchored to the foundation,

(b) a plurality of continuous vertical brackets extending between each of said beams and mounted on at least one of said steel columns, said brackets being of substantially I-shaped substantially horizontal cross section and of integral construction and having two U-shaped segments joined back to back each of which define a central web projecting perpendicularly to the vertical plane from the column, an outer flange extending parallel to said plane, and an inner flange extending parallel to said plane, the web and the inner and outer flanges defining therebetween two oppositely facing vertical guide channels extending parallel to said plane, said segments each also including an edge portion extending inwardly and normally from an outer end of said inner flange, the inner flange and the edge portion of each segment cooperatively fitting and laterally embracing the square cross section of the column, said segments each extending continuously from said edge portion to said outer flange thereof,

(c) a plurality of upright coupling elements arranged between respective ones of the upright steel columns, the coupling elements having upper and lower ends respectively welded to the upper and lower beams, the coupling elements having the same square horizontal cross section as the columns, and a respective one of the vertical brackets mounted on each upright coupling element, and

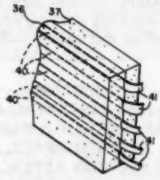
(d) a plurality of vertical wall panels aligned in a plane parallel to said vertical plane, the wall panels having edges slidingly received and engaged in the vertical guide channels of said brackets.

4,287,696

EXPANSIBLE CAULKING MATERIAL

William T. Mullen, 65 W. Street Rd., Suite A-220, Warminster, Pa. 18974

Filed Jul. 10, 1979, Ser. No. 56,343
Int. Cl.[3] E04B 1/62; E04F 15/14
U.S. Cl. 52—309.7 5 Claims



1. A caulking strip for insertion into a space or gap between panels for sealing which comprises

a precompressed compressible and expansible sealing strip of open cell plastic material impregnated with a waterproof adhesive the viscosity of which varies with the temperature and having a volume of the order of one fourth of its expanded volume,

said strip comprising a plurality of bands disposed in parallel relation and in adherent engagement,

metallic heating means extending longitudinally of said strip between said bands with ends for connection thereto of a source of electrical energy,

said heating means being electrically insulated by the plastic material and the impregnant,

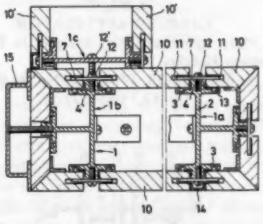
said strip being rapidly and continuously expansible by heat into gripping and holding relation in the joint between said panels and in expanded condition sealing said joint.

4,287,697

WALL PANEL ATTACHMENT APPARATUS

Isamu Matsubara, Nyuzen, and Moriyoshi Hayashi, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Continuation of Ser. No. 859,469, Dec. 12, 1977, abandoned.
This application Nov. 21, 1979, Ser. No. 96,310
Claims priority, application Japan, Dec. 14, 1976, 51-168068
Int. Cl.[3] E04B 1/62
U.S. Cl. 52—403 2 Claims



1. A wall panel attachment apparatus comprising an interior pillar, a plurality of wall panels, fitting fixture and screws, said pillar including a plate-like portion molded to have a cross section providing at least one flange transverse to said plate, each such panel-receiving flange formed at the edge of said plate-like portion, and a joint-inserting portion projected at a central portion of said panel-receiving flange in the direction of extension of the edge of the plate to a reference edge and having a screw-inserting groove in the reference edge extending in its longitudinal direction, said wall panels each having a groove formed in the side edge thereof and being disposed along said panel-receiving flange, said fitting fixture being

fitted into said grooves of adjacent walls panels, said screw applied through the fitting being pressed into said screw-inserting groove to press the fixture against said reference edge and said panels against their respective flanges, whereby a partition wall structure is assembled around said pillar, another pillar with its plate portion transverse to the plate portion of said interior pillar positioned to cover said joint-inserting portion, at least one screw hole in said another pillar, and an extended length screw extending therethrough and into said groove formed in the joint-inserting portion, whereby another pillar is connected to said pillar and against said panels.

4,287,698

METHOD FOR FASTENING A PROFILED CONNECTING SECTION OF A PARTITION FOR WET ROOMS TO A ROOM SURFACE, AND PROFILED CONNECTING SECTION APPLICABLE THERETO

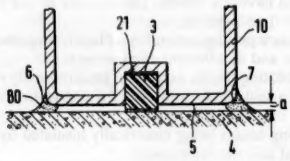
Heinz G. Baus, Ulmenweg 45, CH-3601 Thun, Switzerland

Filed Jun. 22, 1979, Ser. No. 51,196

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1978, 2828537

Int. Cl.³ E04B *2/00*

U.S. Cl. 52—741 **1 Claim**



1. Method for fastening a profiled connecting section having a substantially rectangular side, of a partition for a wet room to a room surface which comprises disposing the side of the profiled connecting section adjacent to but away from the room surface, tacking the profiled connection section by means of an elastic adhering device to the room surface while retaining the connecting section adjacent to but away from the room surface, and subsequently permanently cementing the long edges of the rectangular side of the profiled connecting section to the room surface by means of an elastic adhesive sealing compound while retaining the connecting section adjacent to but away from the room surface, wherein at least one adhesive strip is used for tacking.

4,287,699

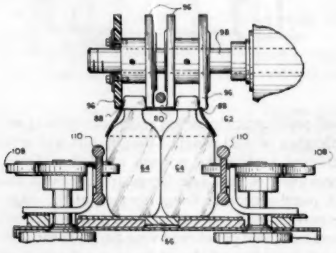
CARRIER APPLICATOR

William F. Hart, Lynchburg, Va., assignor to Dacam Corporation, Madison Heights, Va.

Filed Nov. 15, 1979, Ser. No. 94,807

Int. Cl.³ B65B *21/02*

U.S. Cl. 53—48 **10 Claims**



1. Apparatus for applying a carrier to a pair of upstanding containers each having a neck with a flange, the carrier having means adapted to engage the neck of each container below the flange thereon, the apparatus comprising means for placing a carrier on the containers with the engaging means aligned with the necks of the containers, means for seating the engaging means below the flanges and means for supporting and moving the containers, with the carrier thereon, relative to said seating means, said seating means comprising first and second discs, each having a substantially continuous deformable periphery, and means for mounting said discs in spaced relation such that their respective peripheries are separated by a distance less than the distance between the outer peripheries of the flanges, but great enough to permit the flanges to pass therebetween, as the containers are moved relative to said seating means, each flange deforming the periphery of a different disc and each disc periphery exerting a force, towards said moving means, on the carrier at a location thereon adjacent the outer periphery of the respective flange.

4,287,700

MACHINE FOR FITTING A SLEEVE SEAL OF A FLAT FORM OVER A CONTAINER

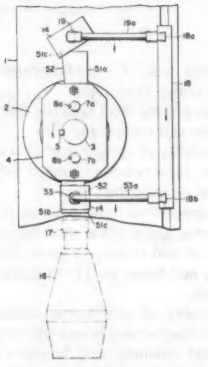
Masaaki Fujio, Suita, Japan, assignor to Fuji Seal Industry Co., Ltd., Osaka, Japan

Filed Oct. 4, 1979, Ser. No. 81,809

Claims priority, application Japan, Sep. 23, 1979, 53-130333

Int. Cl.³ B65B *7/28*; B67B *5/00*

U.S. Cl. 53—292 **3 Claims**



1. A machine for fitting a sleeve seal of a flat form over a container, comprising:

a rotating member;

a pair of half-mandrels mounted on the rotating member with their longitudinal axes substantially intersecting the axis of rotation thereof, and which can move towards and away from one another;

a pair of suction cups for opening the flat sleeve seal, which can move towards one another and away from one another, and which also can move together towards and away from the axis of the rotating member;

a means for pushing off the sleeve seal opened which is fitted over the half-mandrels, which when the rotating member is in a certain predetermined position can be moved towards and away from the axis thereof along the lontitudinal directions of the half-mandrels; and

a means for moving the mandrels, a means for moving the suction cups, and a means for moving the pushoff means; wherein the half-mandrels are formed as halves of an elliptical cylinder, with such a part cut away on at least one of the half-mandrels so that, when they are brought together so that their outside circumferential surfaces form part of the surface of said elliptical cylinder, a part of the side of said elliptical cylinder which is leading as the rotating member rotates is cut away, and more so towards

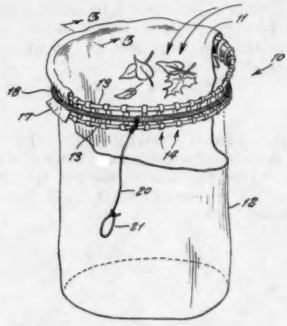
the part of said elliptical cylinder which is nearer to the axis of said rotating member, so as to present a protuberance at the outer leading portion of said elliptical cylinder.

4,287,701

SACK BAG HOLDER

Raymond J. Washington, 300 Terry Dr., Lafayette, La. 70501

Filed Aug. 3, 1979, Ser. No. 63,405
Int. Cl.³ B65B *67/12*
U.S. Cl. 53—390 **4 Claims**



1. A sack holder comprising in combination:

a. a hoop-like assembly with a pair of circular metal rings, axially aligned and spaced apart;

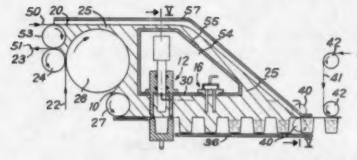
b. a plurality of flat metal strips between said rings, and maintaining said rings spaced apart, a removable coiled tension spring band placed around an outer side of said plurality of strips, and means for removal of said removable tension coiled band from said hoop-like assembly.

4,287,702

METHOD AND INSTALLATION FOR PACKAGING IN A STERILE MEDIUM

Yves J. Corbic, Chatou, France, assignor to Gatrun Anstalt, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 750,959, Dec. 15, 1976, Pat. No. 4,155,786. This application Apr. 28, 1978, Ser. No. 900,870
Claims priority, application France, May 10, 1977, 77 14285
The portion of the term of this patent subsequent to Aug. 28, 1996, has been disclaimed.
Int. Cl.³ B65B *43/08, 47/04, 55/10*
U.S. Cl. 53—425 **45 Claims**



1. A method of packaging in a sterile medium, comprising the steps of:

providing a composite film comprised of a thermoplastic film covered, on a first side, by at least one covering strip;

moving said composite film towards the entrance of a sterile enclosure having sidewalls, an upper wall and a lower wall, the thermoplastic film and the covering film being superimposed in an air-tight manner at least along their edges and with their opposing sides being sterile;

separating the covering film from the thermoplastic film at the entrance to the sterile enclosure;

guiding the thermoplastic film along a path from the entrance to the sterile enclosure to a forming station, the portion of the thermoplastic film being guided along the path forming at least a portion of the lower wall of the sterile enclosure;

forming containers in the thermoplastic film at the forming station inside the sterile enclosure in which slight excess pressure prevails, said forming being performed by shaping the thermoplastic material heated to a forming temperature, the inner surface of said containers being formed by said first side of the thermoplastic film;

filling the containers at the filling station inside the sterile enclosure;

covering the full containers, without their contents being able to be contaminated by non-sterile atmosphere, with a covering strip, whereof at least the side facing the inside of the containers is sterile; and,

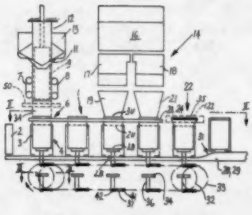
at the outlet of the sterile enclosure, connecting the covering strip in an air-tight manner to at least the edges of the thermoplastic film presenting full containers.

4,287,703

METHOD AND APPARATUS FOR FILLING AND SEALING CONTAINERS

Karl Henle, Reinbek, and Nils von Wichert, Glinde, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,422
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1978, 2851202
Int. Cl.³ B65B *3/02;* **B31B** *7/74*
U.S. Cl. 53—449 **19 Claims**



1. A method of introducing a flowable material into and of sealing such material in the bags of containers which further include boxes for the bags, comprising the steps of introducing boxes which are open at two opposite ends thereof into a first portion of a predetermined conveyance path wherein the boxes advance in a predetermined direction; inserting empty bags, each of which has an open end and a closed end, into successive boxes in a second portion of said path downstream of said first portion, as considered in said direction, so that the closed end of the bag enters into and the open end of the bag is accessible via one open end of the respective box; introducing flowable material through the open ends of and into successive bags in a third portion of said path; maintaining the open ends of successive filled bags outside of the respective boxes, at least in a fourth portion of said path downstream of said second portion; sealing the open ends of successive bags in said fourth portion of said path; and thereupon effecting relative movement between successive filled bags and the associated boxes so as to introduce the sealed ends of successive filled bags into the respective boxes.

4,287,704

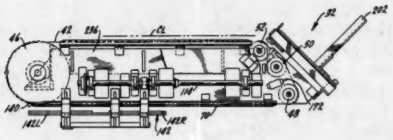
FOLDING AND GLUING MACHINE

George L. Meyers, Ashland, Ohio; Frederick C. Seiden, Holmes Beach, and Lonnie J. Waller, Sarasota, both of Fla., assignors to American Can Company, Greenwich, Conn. and Rexham Corp., Sarasota, Fla.

Division of Ser. No. 954,402, Oct. 25, 1978, Pat. No. 4,210,069. This application Dec. 17, 1979, Ser. No. 104,178

Int. Cl.³ B65B *5/02*

U.S. Cl. 53—564 **19 Claims**



1. In a machine for folding carton blanks along score lines, gluing down a glue flap on the carton, and delivering the glued carton to the supply magazine of a cartoner machine where the carton is erected and then filled by moving the erected carton along a filling path:

means to clamp and pull each carton blank progressively through folding and gluing stations along a folding axis parallel to but spaced from the filling path of the cartoner machine with said one score line also being parallel to said filling path as the blank is being moved through said folding and gluing stations;

means at said stations respectively to fold the blank and glue said glue flap to an opposed surface of the blank;

means to invert the blank after it is glued and while it is still clamped;

and means to deliver the inverted blank to the supply magazine of the cartoner machine.

4,287,705

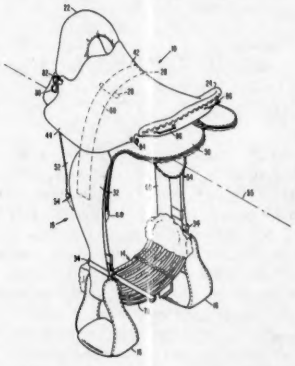
SADDLES

Robert T. Frost, and May Frost, both of 6675 Bluebird Ave., Longmont, Colo. 80501

Filed Mar. 27, 1980, Ser. No. 134,523

Int. Cl.³ B68C *1/02, 1/16*

U.S. Cl. 54—44 **6 Claims**



1. In a saddle having a rigid one-piece tree with a forward pommel and a rearward cantle and conformed on its underside to fit properly atop the back of a horse and on its upper side to comfortably seat a person astride the saddle, a cinch removably mounted to the saddle for encircling the girth of the horse and stirrups adjustably hung from respective sides of the saddle, the improvement comprising:

a pair of comparatively wide, flat and laterally-enclosed sleeves centrally depending from between said pommel and cantle and individually from respective sides of said tree;

a pair of rigid rings individually disposed within and substantially confined against lateral movement by the respective lower end portions of each of said sleeves;

adjustable fastening means for securing respective ends of said cinch between said rings;

a flexible strap having its opposing ends secured to respective ones of said rings and extending from said rings through said sleeves and said tree and over the top of said tree;

and a covering layer atop said tree for separating said strap from said person, whereby said sleeves, rings, fastening means and strap inhibit fore, aft or rocking movement of said saddle on said horse.

4,287,706

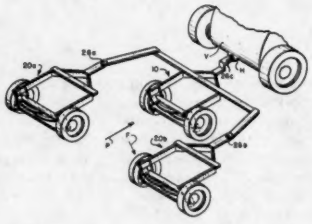
GANG MOWER ASSEMBLY

Leo W. Tobin, Jr., Morehouse La., Darien, Conn. 06820

Filed Feb. 4, 1980, Ser. No. 118,279

Int. Cl.³ A01D *75/30*

U.S. Cl. 56—7 **4 Claims**



1. A gang mower assembly for the pulling of push-type reel mowers having a wheel axis, a reel axis and a ground roller axis by a vehicle exerting a pulling force in a pulling direction, comprising:

a leading mower mount having first connecting means for connecting same to the pulling vehicle for movement both laterally and perpendicularly with respect to the pulling direction;

two trailing mower mounts each including second connecting means for connecting same to the leading mower mount for movement both laterally and perpendicularly with respect to the pulling direction and independent of the movement of the other mounts; and

mounting means disposed on each mower mount for mounting a push-type reel mower thereon between the reel axis and the ground roller axis and below the height of the wheel axis thereof to exert a downwardly slanted force in the pulling direction in response to the application of the pulling force.

4,287,707

HARVESTERS

Gustaaf M. Persoons, Schoten, Belgium, and Corneel C. Wijts, San Jose, Calif., assignors to FMC Corporation, San Jose, Calif.

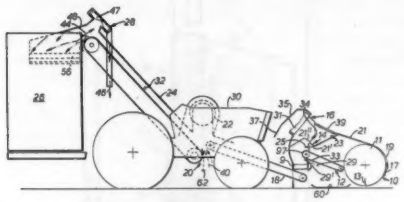
Division of Ser. No. 686,604, May 14, 1976, Pat. No. 4,178,743. This application Jun. 18, 1979, Ser. No. 49,696

Int. Cl.³ A01D *45/22*

U.S. Cl. 56—12.8 **11 Claims**

1. A bean harvester assembly arranged for mounting on a tractor, said assembly comprising a casing enclosing; the upper peripheral portion of a crop pick-up device, a first generally horizontal rearwardly extending conveyor arranged to receive crop and trash such as leaves and vine fragments from said pick-up device and a second conveyor disposed transversely to

and positioned to receive crop and a portion of the trash discharged by said first conveyor and transport them laterally relative to said first conveyor; said casing having a rearwardly extending wall overlying said first conveyor and including an inclined downwardly directed portion terminating in an edge above the discharge end of said first conveyor, said first conveyor together with the edge of said casing portion defining a generally rectangular passageway through which crop and trash are discharged for reception by said second conveyor, means forming a closure for said rectangular passageway for restricting the passage of air therethrough while allowing the passage of crop and trash, said second conveyor lying below said first conveyor a sufficient distance to form an opening therebetween, means for producing high velocity air flow traveling in an upwardly directed path through said opening between the first and second conveyors such that air currents



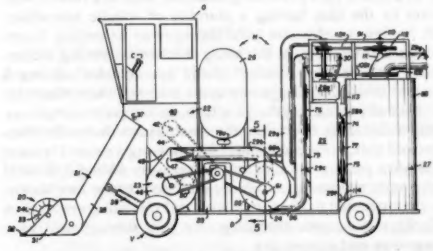
pass in substantial cross current relationship with the crop and trash traveling downwardly from said first to said second conveyor, said air currents entraining and removing a substantial portion of the trash from the heavier subsequently collected crop, a third conveyor having its inlet underlying the discharge end of said second conveyor and positioned normally with respect thereto to convey crop and remaining trash in a direction opposite to the direction of tractor movement, an elevating conveyor in longitudinal alignment with said third conveyor and having its inlet underlying and vertically downwardly spaced from the discharge of said third conveyor to produce a gap, means for producing upwardly flowing high velocity air currents traversing said gap to thereby entrain and remove additional trash from the crop to be collected, and storage means for collecting the crop conveyed thereto by said fourth conveyor.

4,287,708

ALFALFA HARVESTING AND PROCESSING APPARATUS

Allen B. Neely, Jr., 676 S. Oakland, Aurora, Colo. 80012

Filed Aug. 13, 1979, Ser. No. 65,956
Int. Cl.³ A01D *43/00*
U.S. Cl. 56—13.5 **15 Claims**



1. In the combination of a harvesting apparatus adapted to move through a field of vegetation having a liquid component and a fiber component to mow and gather the vegetation, a processing means to grind the vegetation to a pulp as it is received, extract and collect the liquid component thereof and discharge the fiber therefrom, wherein a grinding means includes:

a cylindrical screen rotating on a generally horizontal axis;

rotating means provided with pivoted hammers whose circle of maximum extension is less than the interior diameter of said screen, said hammers moving close to the lower inside portion of said screen for grinding; and

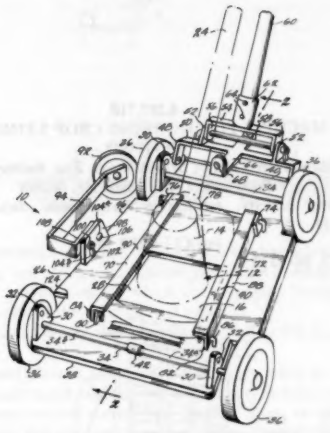
means spaced from the path of said hammers for forcing material inwardly through the holes in said screen.

4,287,709

CARRIAGE FOR A GRASS TRIMMING DEVICE

Joseph M. Lowry, 308 Sweetbriar Dr., and Ernest E. Griffin, 12306 Ridgefield Pkwy., both of Richmond, Va. 23233

Filed Feb. 6, 1980, Ser. No. 119,176
Int. Cl.³ A01G *3/06*
U.S. Cl. 56—16.9 **9 Claims**



1. A carriage for a trimming device of the type having a motor, a housing for the motor, a cutting element in the form of a length of cable connected to said motor so as to be rotatable about an axis at high speed for cutting grass, weeds and the like, said carriage comprising:

a platform having a top and a bottom side, means for supporting said platform for movement over the ground,

an aperture in said platform for receiving and supporting a motor driven cutting device,

releasable clamping means movably mounted on said top side of said platform for securely holding the cutting device in said aperture with the cutting element disposed to extend from said bottom side of said platform and with the motor on said top side thereof above said aperture, said clamping means including first and second retaining arms each having one end pivotally mounted on said top side of said platform at spaced apart locations, each arm being pivotable between an open position, wherein said aperture in said platform is unobstructed by said arms, and a closed position, wherein each said arm extends to a respective portion of said platform on the side of said aperture opposite to said respective locations, said platform having grasping means for engaging and releasably holding the other ends of said retaining arms so that, when a motor housing is disposed in said aperture, said retaining arms will engage the housing when said retaining arms are in said closed position, arms so that, when a motor housing is disposed in said aperture, said retaining arms will engage the housing when said retaining arms are in said closed position,

said grasping means comprising a pair of flange members mounted on said platform and each extending substan-

tially perpendicular to said platform and each being located so as to cooperate with an associated retaining arm, pin receiving apertures in each said flange member, said retaining arms each having, adjacent said respective other ends thereof, pin receiving apertures therein each located so as to be alignable with said pin receiving aperture on an associated flange member, when said retaining arms are in said closed position, pin means for insertion into said respective apertures of said flange members and retaining arms.

4,287,710

HAY MACHINE FOR WORKING CROP LYING ON THE GROUND

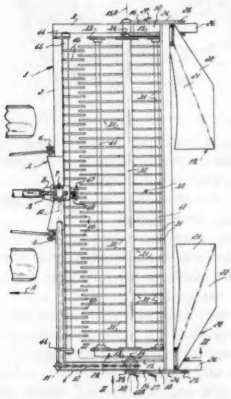
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Jun. 7, 1979, Ser. No. 46,238

Claims priority, application Netherlands, Jun. 8, 1978, 7806224

Int. Cl.³ A01B *33/00*

U.S. Cl. 56—372 **12 Claims**



1. A hay machine for working crop lying on the ground comprising a frame and a tine carrier mounted on said frame for rotation about a first horizontal axis, elongated tines mounted on said carrier and said tines being turnable about a second horizontal axis spaced from said first axis, driving means, including a transmission of engaged gears connected to rotate said carrier together with tines about the first axis and the tines about said second axis, said driving means being connected to rotate said carrier in a forward direction through a generally circular path with respect to the direction of machine travel, and orientate said tines forwardly and generally horizontally while being moved through the lower portion of said path, adjacent the ground to pick up crop on the ground, said transmission being connected to rotate the tines during rotation of the carrier in a relative opposite direction from that of the carrier, said tines being rotated to lift crop up and over the carrier and deposit same to the rear thereof.

4,287,711

MOUNTABLE TUBE FOR A TEXTILE SPINDLE

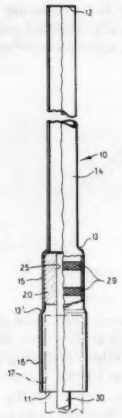
Max Hartmannsgruber, Kirchheim; Egon Nigg, and Kurt Hack, both of Ebersbach, all of Fed. Rep. of Germany, assignors to Firma Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Mar. 27, 1980, Ser. No. 134,398

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913500

Int. Cl.³ B65H *75/02*

U.S. Cl. 57—130 **6 Claims**



1. A metallic mountable tube for the upper spindle portion of a textile spindle in which:

said mountable tube is formed from a one-piece tubular sheath and includes a lower whorl portion.

4,287,712

PNEUMATICALLY DISENGAGEABLE SELF-THREADING YARN BRAKE MECHANISM IN A HOLLOW SPINDLE ASSEMBLY OF A TEXTILE YARN PROCESSING MACHINE AND RELATED METHOD

Gustav Franzen, Willich, and Johannes Frentzel-Beyme, Monchen-Gladbach, both of Fed. Rep. of Germany, assignor to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Jul. 10, 1979, Ser. No. 56,212

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1978, 2830265

Int. Cl.³ D01H *15/00, 7/86*

U.S. Cl. 57—279 **14 Claims**

1. In a textile yarn processing machine, such as a two-for-one twister or the like, having a plurality of spindle assemblies, each having an elongate yarn passageway extending therethrough and including a threading mechanism having a compressed air operated injector nozzle operable for sucking a yarn into said yarn passageway at the inlet end thereof and for automatically threading the yarn through the yarn passageway during a thread-up operation, the combination therewith of an improved yarn brake mechanism for applying a desired tension to the yarn passing through said passageway during operation of the yarn processing machine, said yarn brake mechanism being constructed to cooperate with said threading mechanism to facilitate automatic threading of a yarn through said yarn passageway and comprising

a tubular brake housing located in said spindle assembly with said yarn passageway extending axially therethrough,

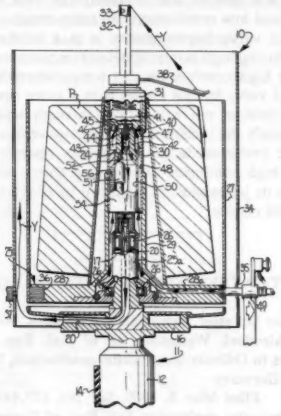
an upper hollow insert mounted within said brake housing with said yarn passageway extending therethrough, and including means defining the upper end of an enlarged cavity forming a part of and enlarging a portion of said

yarn passageway, and an upper annular braking ring surrounding the yarn passageway at the entrance to said cavity,

a lower hollow insert mounted within said brake housing with said yarn passageway extending therethrough, and including means defining the lower end of said enlarged cavity, and a lower annular braking ring surrounding the yarn passageway at the exit from said cavity,

an elongate capsule-shaped braking cartridge positioned within said cavity with opposite ends thereof adapted to be positioned in engagement with said upper and lower braking rings,

means for biasing said upper and lower inserts toward one



another so that said upper and lower braking rings engage opposite ends of said braking cartridge for applying tension to a yarn passing therebetween,

means cooperating with one of said upper or said lower inserts and actuable by the compressed air supplied to said threading mechanism for overcoming said biasing means and moving said one insert away from the other insert to release said braking cartridge from engagement by said upper and lower braking rings, and

means for moving said braking cartridge upon the release thereof by said upper and lower braking rings laterally out of the path of the yarn being threaded through said cavity to thus provide a clear path for threading the yarn through said yarn passageway.

4,287,713

PROCESS FOR LOW-TORQUE TEXTURED YARN

James E. Bromley, and Frank Stutz, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 866,745, Jan. 3, 1978, abandoned. This application Jul. 19, 1979, Ser. No. 59,014

Int. Cl.³ D02G *1/20*

U.S. Cl. 57—288 **3 Claims**

1. A process for producing a low-torque textured polyester yarn, comprising:

a. selecting a spun polyester yarn having an elongation of 55–195% and having sufficient torqueless latent crimp to provide when hot-drawn at 200° C. to an elongation of 30% a bulk of at least 8%, and

b. draw-texturing said spun yarn at a temperature above the second order transition temperature to a drawn yarn having a denier of at least 250 and an elongation between 10 and 45%.

4,287,714

FALSE-TWISTING SYSTEM

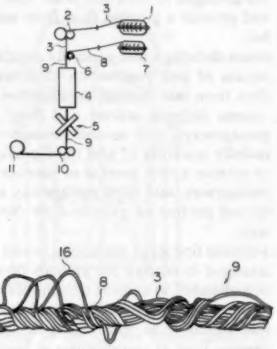
Isao Takai, Komatsu, Japan, assignor to Oda Gosen Kogyo Kabushiki Kaisha, Komatsu, Japan

Filed Aug. 23, 1979, Ser. No. 69,143

Claims priority, application Japan, Aug. 31, 1978, 53-106900; Aug. 31, 1978, 53-106901; Aug. 31, 1978, 53-106902; May 16, 1979, 54-59096; May 16, 1979, 54-59097

Int. Cl.³ D02G *3/38, 1/04*

U.S. Cl. 57—336 **10 Claims**



1. A composite crimped filament yarn, characterized by comprising first and second filament yarns each consisting of a plurality of monofilaments which are entangled firmly with monofilaments of the other of said yarns;

each of said filament yarns having S- and Z-twists in combination;

one of said filament yarns serving as a core while the other is twined round said core by a nipping type false twisting apparatus which causes said filament yarns to advance together therethrough in such a manner that said filament yarns are subjected to a greater tension at an inlet side of said false twisting apparatus than at an outlet side thereof.

4,287,715

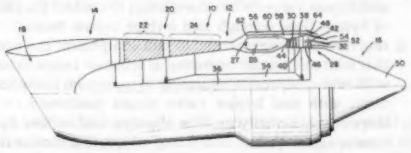
SUPERSONIC JET ENGINE AND METHOD OF OPERATING THE SAME

Garry Klees, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 890,364, Mar. 27, 1978. This application Nov. 24, 1978, Ser. No. 963,907

Int. Cl.³ F02K *1/24, 3/02*

U.S. Cl. 60—204 **32 Claims**



1. A supersonic jet engine adapted to cruise at supersonic speeds at a relatively high efficiency, to operate with turbine inlet temperatures of at least 2500° F. for high power operation, and to cruise subsonically with a relatively low specific fuel consumption, said engine comprising:

a. a housing structure having an upstream inlet end to receive intake air, and a downstream exhaust end to discharge jet exhaust,

b. an air inlet arranged to receive intake air at subsonic

velocity and also to receive intake air at supersonic velocities and reduce said air to subsonic velocity,

c. a compressor mounted in said housing rearwardly of said inlet and arranged to compress air flowing into said inlet, said compressor having an inlet end and an outlet end arranged to operate between a maximum compression ratio and a minimum compression ratio,

d. means defining a combustion chamber mounted in said housing downstream of said compressor to receive compressed air therefrom,

e. fuel injection and ignition means in said combustion chamber arranged to burn fuel in air flow from the compressor and provide a gaseous flow from said combustion chamber,

f. means defining a first generally annular passageway downstream of said combustion chamber to receive gaseous flow from said combustion chamber,

g. means defining second and third generally coannular passageways, said second passageway being positioned radially inwardly of said third passageway and arranged to receive a first portion of gaseous flow from said first passageway, said third passageway arranged to receive a second portion of gaseous flow from said first passageway,

h. a turbine first stage positioned in said first passageway and arranged to receive the gaseous flow from said combustion chamber so as to be driven thereby with said gaseous flow proceeding to said second and third passageways, said turbine first stage being arranged to receive said gaseous flow at temperatures at least as high as 2500° F. and also at lower temperatures, said turbine first stage having a predetermined cross-sectional nozzle area,

i. a turbine second stage positioned in said second passageway and arranged to receive said first portion of gaseous flow so as to be driven thereby,

j. nozzle means positioned downstream of said second and third passageways to receive the first portion of gaseous flow and discharge said first portion at a radially inward location at a relatively low velocity, and to receive the second portion of gaseous flow and discharge said second portion at a relatively high velocity in a generally annular pattern radially outward of the radially inward location of the first portion of gaseous flow,

k. turbine bypass means to receive flow from a location downstream of said compressor as bypass flow, and to direct said bypass flow along a path bypassing said turbine first stage, and exhaust said bypass flow from said engine to produce a thrust,

l. bypass valve means to control the amount of flow bypassed into said turbine bypass means,

m. engine control means operatively connected to said fuel injection and ignition means and to said bypass valve means, in a manner to control the amount of fuel directed to said fuel injection and ignition means and to control said bypass valve means in a manner to control the amount of bypass flow through said turbine bypass means,

n. said turbine being matched to said compressor in a manner that with said engine operating at subsonic cruise velocity, with said compressor operating at maximum compression ratio, with said bypass valve means positioned so that there is substantially no flow through said turbine bypass means, and with fuel flow being adequate to create thrust to match airplane drag at said subsonic cruise velocity, the tubine first stage has a flow area sized to allow gaseous flow therethrough at the speed of sound in said gaseous flow, o. said engine control means being arranged to set said bypass valve means at a more open position at higher engine thrust settings where higher temperatures are created in said combustion chamber, and to set said bypass valve means at a more closed position at lower engine thrust settings where lower temperatures are created in said combustion chamber, in a manner that there is substantially constant corrected gaseous flow into said turbine first stage, said corrected flow being measured according to the formula:

$$\frac{W\sqrt{\theta+}}{\delta+} = \text{corrected flow}$$

where:

W = Total mass flow rate in lbs. per second

$\theta+$ = Observed temperature (absolute) divider by standard temperature (518.67°R)

$\delta+$ = Observed pressure divided by standard pressure (2116.22 lbs./sq.ft.)

whereby during subsonic cruise said engine can operate at a relatively low specific fuel consumption with high compression ratio and low combustion exit temperature, in a condition where said valve bypass means is at a substantially closed position, during high power acceleration mode said engine can operate at high combustion exit temperatures in a condition where said valve bypass means is in a more open position to maintain constant corrected flow through said turbine first stage to satisfy the turbine first stage requirements, and during supersonic cruise mode the engine can operate efficiently at relatively high combustion exit temperatures, and said engine discharges its jet exhaust in a pattern to alleviate noise generated by said engine.

4,287,716

EXHAUST GAS SYSTEM FOR INTERNAL COMBUSTION ENGINES

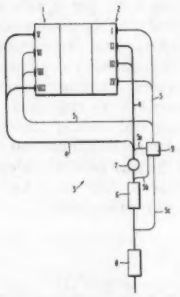
Hans-Dieter Schuster, Schorndorf; Karl Jans, Wendlingen, and Rolf Ohlendorf, Weinstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 5, 1980, Ser. No. 127,448

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912796

Int. Cl.[3] **F01N** *3/15;* **F02D** *17/00*

U.S. Cl. 60—276 **6 Claims**



1. An exhaust gas system for a multi-cylinder internal combustion engine, comprising several cylinder means, a common exhaust line means operatively connected with predetermined cylinder means and including an O_2-probe means and two catalyst means series-connected downstream of the O_2-probe, characterized in that at least one cylinder means is adapted to be effectively disconnected, and in that a separate exhaust gas line means is coordinated to the cylinder means adapted to be effectively disconnected, said separate exhaust gas line means including three separate line connections leading to the common exhaust line means, and load dependent control means for opening a respective one of said line connections in such a manner that when all cylinder means are effectively connected and operate as internal combustion engine, the line connection terminating in the common exhaust line means upstream of the

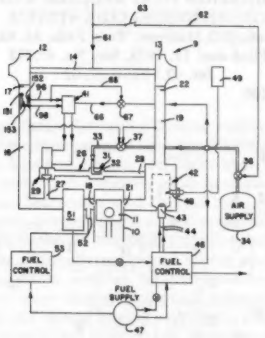
O_2-probe means is opened, that with at least one cylinder means effectively disconnected and with a cold internal combustion engine up to a middle operating temperature, the line connection terminating in the common exhaust gas line means between the O_2-probe means and the catalyst means arranged downstream thereof is opened, and that the line connection terminating in the common exhaust gas line means between the two catalyst means is opened when the temperature of the engine exceeds the middle operating temperature.

4,287,717

TURBOCHARGED INTERNAL COMBUSTION ENGINE

Thomas A. Oldfield; Edward D. Smith, both of Columbus, Ind., and Hideo Furukawa, Oyama, Japan, assignors to Cummins Engine Company, Inc., Columbus, Ind. and Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 4, 1979, Ser. No. 906
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—606 **7 Claims**



1. Apparatus for use in a diesel engine including at least one engine cylinder, a turbine-compressor having a surge line characteristic, an intake manifold connecting the compressor outlet to the cylinder, and an exhaust manifold connecting the turbine intake with the cylinder, said apparatus comprising a by-pass pipe adapted to be connected between said compressor outlet and said turbine intake, bypass valve means in said pipe for controlling the volume of by-passed air flowing out of said compressor outlet and through said pipe to said turbine intake, sensing means for sensing the static and dynamic air pressures at said compressor outlet and for regulating said bypass valve means in response to the ratio of the static and dynamic air pressures, said sensing means including pressure ratio responsive means for regulating said volume of by-passed air to maintain compressor operation adjacent to said surge line, and a burner mounted between said pipe and said turbine intake and connected to receive both by-passed air from said pipe and exhaust from the exhaust manifold.

4,287,718

CONDENSER VACUUM LOAD COMPENSATING SYSTEM

Jimmy R. Dickey, Jacksonville Beach, Fla., assignor to Offshore Power Systems, Jacksonville, Fla.

Division of Ser. No. 856,064, Nov. 30, 1977, Pat. No. 4,206,013.
This application May 2, 1979, Ser. No. 35,167
Int. Cl.³ F01K *11/00*
U.S. Cl. 60—687 **6 Claims**

1. A condenser for eliminating the vacuum load on a steam turbine support arising from the condensation of the turbine exhaust steam, comprising:

a condenser steam inlet;

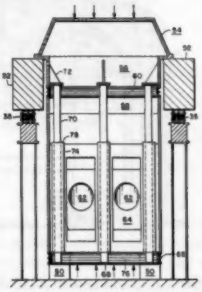
an expandable coupling hermetically connected to the condenser steam inlet at one end adapted to communicably couple the turbine exhaust and condenser steam inlet through an expandable path;

a condensation chamber communicably coupled to the steam inlet;

means for condensing steam within the condensation chamber;

means for rigidly supporting the condenser;

a load bearing member having at least a portion of a surface thereof hermetically communicating with the interior of the condensation chamber;



means for transmitting to the turbine forces acting on the load bearing member due to the vacuum generated from the condensation of steam within the condensation chamber, to a degree equal and in a direction opposite to the forces acting directly on the turbine from the vacuum load communicated from the condensation chamber;

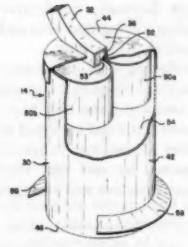
means for substantially preventing the condensed steam from exerting a load on the load bearing member.

4,287,719

CARBON DIOXIDE SNOW HOOD WITH J-HORN

Peter A. Students, West Chester, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Filed Sep. 18, 1980, Ser. No. 188,425
Int. Cl.³ F25J *1/00*
U.S. Cl. 62—10 **11 Claims**



10. A method of forming a confined, low velocity deposit of larger-particle CO_2 snow, said method comprising the steps of:

generating a flow of mixed fine-particle CO_2 snow and CO_2 vapor;

separating said flow into a first concentrated stream of fine-particle CO_2 snow and a second stream;

dividing said first stream into a pair of segregated counter-swirling streamlets;

introducing said streamlets in juxtaposition into a common mixing chamber whereby to transform the fine-particle CO_2 snow into large-particle snow by interaction of the snow particles in the counterswirling streamlets;

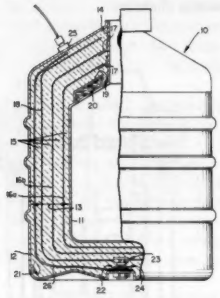
discharging said mixed streamlets from said chamber.

4,287,720

CRYOGENIC LIQUID CONTAINER

Alfred Barthel, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 21, 1979, Ser. No. 96,407
Int. Cl.³ F17C *1/00*
U.S. Cl. 62—45 **12 Claims**



1. A cryogenic liquid container comprising:
(a) an inner vessel for holding cryogenic liquid;
(b) an outer shell surrounding said inner vessel arranged and constructed with respect to said inner vessel so as to form an evacuable space therebetween;
(c) insulation material disposed within and substantially filling said evacuable space; p1 (d) at least one high thermally conductive heat interceptor member disposed within and surrounded by said insulation material and oriented generally parallel to the inner vessel wall;
(e) at least one thermoelectric heat pump within said evacuable space being positioned between said heat interceptor member (d) and said outer shell (b) and having a hot end facing said outer shell (b) and a cold end facing said heat interceptor member (d);
(f) heat dissipation means for transferring heat from said hot end of (e) to the ambient surrounding said outer shell;
(g) first high thermally conductive means within said evacuable space joining said hot end of (e) and said heat dissipation means (f); and
(h) second high thermally conductive means within said evacuable space joining said cold end of (e) and said heat interceptor member (d); with
(i) said thermoelectric heat pump (e), said first high thermally conductive means (g), said second high thermally conductive means (h) and said heat interceptor member (d) being constructed and arranged so that said heat interceptor member (d) assumes temperature lower than temperature assumed by said heat interceptor member (d) absent said construction and arrangement.

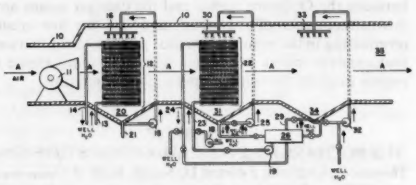
4,287,721

CHEMICAL HEAT PUMP AND METHOD

Harry I. Robison, 2916 Midway Loop, Pawleys Island, S.C. 29585

Filed Jun. 11, 1979, Ser. No. 47,356
Int. Cl.³ F25D *17/06*
U.S. Cl. 62—94 **14 Claims**

1. In an apparatus for heating or cooling air wherein means are provided for forming an air conduit and for conducting air through said conduit for effecting said heating or cooling, the combination which comprises:
(a) means in said conduit for spraying said air with water,
(b) means also in said conduit for spraying said air with a hygroscopic liquid under conditions effective to extract humidity from said air,



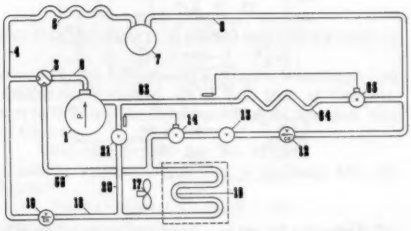
(c) means for separating water from said hygroscopic liquid to concentrate the same, and
(d) means for re-using the concentrated hygroscopic liquid.

4,287,722

COMBINATION HEAT RECLAIM AND AIR CONDITIONING COIL SYSTEM

Douglas C. Scott, 502 Madrona, Twin Falls, Id. 83301

Filed Jun. 11, 1979, Ser. No. 47,273
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—200 **22 Claims**



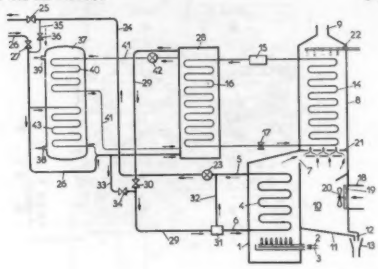
1. In a refrigeration system having:
compressor means having a suction and a discharge, a compressor discharge header connected to the discharge the compressor means,
first condensing means,
a condenser supply line operatively connecting said compressor discharge header to said first consenser means,
evaporator means,
evaporator supply means for operatively connecting said first condenser means to the evaporator means,
compressor suction header connecting the evaporator means to the suction of the compressor means for receiving the discharge of the evaporator means,
a combined heat reclaim and air conditioning coil comprising:
(a) a coil, having an inlet and an outlet, for condensing refrigerant gas or evaporating low pressure refrigerant liquid; and
(b) coil supply means for selectively connecting the inlet of the coil to either the compressor discharge header or to the evaporator supply means; and
(c) coil discharge means for operatively connecting the outlet of the coil to the condenser supply line when the coil supply means is operatively connected to the compressor discharge header or operatively connecting the outlet of the coil to the compressor suction header when the coil supply means is operatively connected to the evaporator supply means; and
(d) control means for selectively directing the flow of compressed refrigerant gas from the compressor discharge header to the coil supply means when the coil is to be used for condensing refrigerant gas or for selectively directing the flow of low pressure refrigerant liquid from the evaporator supply means to the coil supply means when the coil is to be used for evaporating low pressure refrigerant.

4,287,723

CENTRAL HEATING AND/OR SANITARY OR INDUSTRIAL HOT-WATER PRODUCTION INSTALLATION

Rene Dosmond, "La Poussiniere" Hameau de la Jonchere Chemin des Vignes, 92500 Rueil-Malmaison, France

Filed Mar. 4, 1980, Ser. No. 127,232
Claims priority, application France, Mar. 5, 1979, 79 05660
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.6 **6 Claims**



1. An installation for central heating and/or hot water production of the type using at least one source of conventional heat of the liquid or gaseous fuel boiler kind, and at least one source of heat pump thermodynamic heat, particularly of the compression heat cycle kind formed by a closed circuit in which flows a refrigerating fluid and comprising in series, in a way known per se, an evaporator, a compressor, a condenser forming the thermodynamic heat source properly speaking, and an expansion member for the condensed refrigerating fluid, one or more circuits for the circulation of the heat-carrying fluid of the central heating and for the production of sanitary or industrial hot water being furthermore provided and arranged to be the seat of heat exchanges with said above-mentioned heat sources, an installation in which a heat pump evaporator is situated in a duct for discharging the combustion gases from the boiler, there being provided in conjunction with this duct, upstream of said evaporator, one or more outside air intakes provided with flow-regulating means, wherein said duct contains several independent evaporators which, considered successively in the flow direction of the gases (air and water vapor and possibly combustion gases) are subjected to decreasing temperatures, each evaporator being associated with a condenser in a compression heat pump heat circuit so that the temperature difference between each evaporator and the condenser which is associated therewith is relatively reduced—of the order of 40° to 45° C.

4,287,724

AIR CHILLER/DRIER

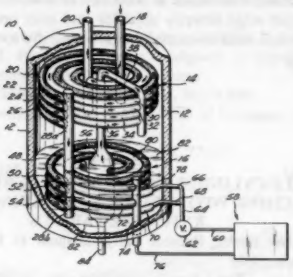
Ralph E. Clark, Villanova, Pa., assignor to Morehouse Industries, Inc., Fullerton, Calif.

Filed Dec. 17, 1979, Ser. No. 104,410
Int. Cl.³ F25D *21/00*
U.S. Cl. 62—272 **9 Claims**

1. An air drier comprising:

a pre-cooler section for partially cooling air from an air source comprising conduits for ducting incoming warm moist air and conduits for ducting outgoing cooled dry air, at least one pair of conduits formed from an outgoing cooled dry air conduit and an incoming warm air conduit being interposed in coaxial spirals so that sections of said cooled dry air conduit alternate in intimate surface area contact with sections of said incoming warm air conduit; and

a chiller section comprising means for cooling said partially cooled air to a temperature below its dew point to produce chilled air which, when separated from liquid condensed from said chilled air, produces chilled dry air, said means for chilling said partially cooled air including a refrigerant, means for evaporating said refrigerant to absorb heat from the surrounding environment, means for ducting said air to the surrounding environment of said



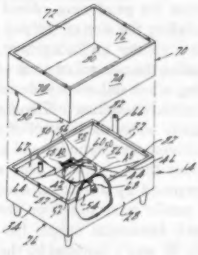
evaporating means to lower the temperature of said air below its dew point, and means for conducting thermal energy between said ducting means and said evaporating means, said thermal conducting means being located exclusively within said chiller section.

4,287,725

ICE TRANSPORT AND DISPENSING SYSTEM

Walter H. Hoenisch, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Prospect Heights, Ill.

Continuation of Ser. No. 906,228, May 15, 1978, abandoned, which is a division of Ser. No. 622,151, Oct. 14, 1975, Pat. No. 4,104,889, which is a continuation of Ser. No. 395,712, Sep. 10, 1973, abandoned. This application Feb. 13, 1980, Ser. No. 121,147
Int. Cl.³ F25C *5/18*
U.S. Cl. 62—344 **7 Claims**



1. In combination in an ice storage and transport system,

means defining an ice storage compartment adapted to receive and store discrete pieces of ice,

conduit means arranged along a first axis and extending along a path from said storage compartment to a remote location and adapted to communicate ice along said path,

an air blower for introducing a relatively high velocity flow of air into said conduit means for causing discrete pieces of ice to be communicated therewithin,

means within said compartment including a generally conically-shaped rotatable element for causing ice stored within said compartment to be moved toward a position adjacent a portion of said conduit means, said element having the upper surface thereof tapered radially outwardly and downwardly to cause ice to move toward an inlet opening in said conduit and being located downstream from said air blower, said element being mounted

for rotation about a generally vertical axis such that the first axis is tangentially oriented with respect to the outer peripheral edge of said rotatable element,

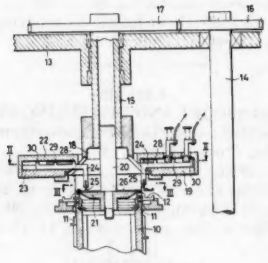
power operated means for effecting rotation of said element, said compartment comprising downwardly and inwardly inclined side walls, at least one of which terminates at its lower edge directly adjacent said inlet opening whereby ice will slide inwardly and downwardly toward said opening.

4,287,726

SINGLE-CYLINDER CIRCULAR HOSIERY KNITTING MACHINE WITH DEVICE FOR MAKING RIBBED KNITWEAR FABRICS

Bruno Del Barba, Brescia, Italy, assignor to IRMAC S.p.A., Brescia, Italy

Filed Apr. 2, 1979, Ser. No. 26,348
Claims priority, application Italy, Apr. 7, 1978, 22089 A/78
Int. Cl.³ D04B 9/22
U.S. Cl. 66—24 **3 Claims**



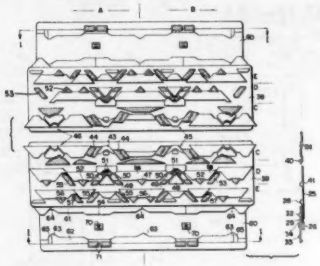
1. A single-cylinder circular hosiery knitting machine fitted with a device for producing ribbed knit-wear articles by a process including the step of shifting knit loops, comprising a vertical-axis cylinder including vertical needles axially displaceable under the control of cams of a cylinder cam box and also including stitch sinkers, a plate or disc coaxially overlying the cylinder and including horizontal needles which can be pushed radially under the control of cams of a plate cam box, means for driving said cylinder and said plate in synchronous rotation about their common axis, wherein each couple of needles composed by a vertical needle and its corresonding horizontal needle is arranged on the same radial plane and wherein each horizontal needle has its shank bent through substantially 90° and is fastened by the bent end of the shank to the bottom end of an L-shaped selector member guided by its horizontal portion within a radial slot of the plate, and wherein said shank includes a bevel adjacent said bend to deflect each said vertical needle from said radial plane during the centripidal movement of each said horizontal needle, the cams of the plate cam box being capable of acting upon butts projecting from the horizontal portion of said selector members, and at least one of said cams of said plate cam box being capable of originating movements of said selector members having horizontal needles fastened thereto in the centrifugal direction through such a distance as to bring the bent shanks of the horizontal needles to a position which is radially external with regard to the vertical movement paths of the corresponding vertical needles, whereby said horizontal needles do not interfere with said vertical needles except during the deflection of said vertical needles provided by said bevels during centripidal movement of said horizontal needles during shift of loops from said horizontal to said vertical needles.

4,287,727

FLAT BED KNITTING MACHINE

Kazuo Otoshi, Hiroshima, Japan, assignor to Tatsumi Seiki Co., Ltd., Hiroshima, Japan

Filed Feb. 12, 1980, Ser. No. 120,955
Claims priority, application Japan, Jun. 18, 1979, 54-84074[U]
Int. Cl.³ D04B 7/00, 15/66
U.S. Cl. 66—75.2 **8 Claims**



1. In a flat bed knitting machine of the type comprising a pair of needle beds arranged cross-sectionally in an inverted V-shape, a plurality of needles disposed in needle slots in each of said needle beds, a jack disposed in each needle slot for controlling the movement of the needle, a selector jack for actuating the needle-actuating jack, a carriage movable on said needle bed and provided with a cam plate facing each needle bed, a selector controllablee electrically in accordance with a patternfor pushing the selector jacks and angularly moving the selector jacks in said needle slots to place their butts out of the camming action; the improvement wherein said cam plate has a group of cams for acting on butts of the jacks, said group of cams including a tuck cam for acting on jack butts so as to advance the needles associated with the jacks to a tucking position, and a unit of cams composed of fixed cams and movable cams arranged in an inverted V-shape around the tuck cam for acting on jack butts to thereby advance the needles to a knitting position; control means for controlling selected jacks to shift their butts to a tucking position in which they move over the movable cams retracted in their inoperative position, and engageable with the tuck cam; and raising means for advancing jacks associated with the selector jacks newly selected by the selectors after the selection of said jacks, to a position upward of said tucking position, for enabling the jacks to engage with the upper cams in said unit of cams.

4,287,728

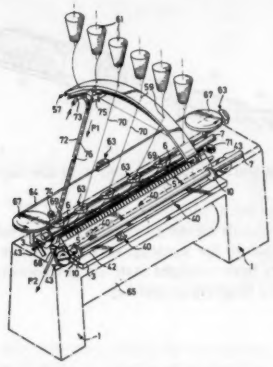
THREAD GUIDANCE IN MESH-FORMING MACHINES WITH ROTATING THREAD GUIDES

Manfred Schmid, Bempflingen; Werner Sommer, Esslingen, and Antonius Vinnemann, Stuttgart, all of Fed. Rep. of Germany, assignors to Sulzer Morat GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 776,910, Mar. 11, 1977, Pat. No. 4,109,491, which is a continuation of Ser. No. 705,285, Jul. 18, 1976, abandoned. This application Feb. 28, 1978, Ser. No. 882,184
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1975, 2531734
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.³ D04B 3/06
U.S. Cl. 66—125 R **24 Claims**

1. A method of automatically feeding to a loop forming machine a plurality of threads by a plurality of thread guiding means and a plurality of movable elements, said method comprising the steps of moving said movable elements one after the other in one direction along an endless path, each movable

element having a first position corresponding to the beginning of and a second position corresponding to the end of a fabric produced by said machine; feeding said threads via said movable elements to said machine only during movement of said movable elements from said first position to said second position; cutting said threads for obtaining thread ends when said movable elements arrive at said second position; removing said



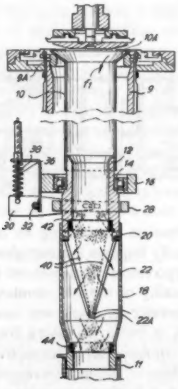
thread ends from said movable elements; returning said thread ends back to said first position so that twisting of said plurality of said threads will not occur; returning said movable elements back to said first position along said endless path; and combining each of said returned thread ends with an associated one of said returned movable elements at said first position for again feeding the thread associated with said thread end to said machine via said associated movable element.

4,287,729

CIRCULAR KNITTING MACHINES

Anna Manini nee Gallichi, Via Pacini 43, Florence, Italy

Filed Apr. 30, 1979, Ser. No. 34,479
Claims priority, application Italy, May 3, 1978, 9444 A/78
Int. Cl.[3] D04B *15/92*
U.S. Cl. 66—149 S **10 Claims**



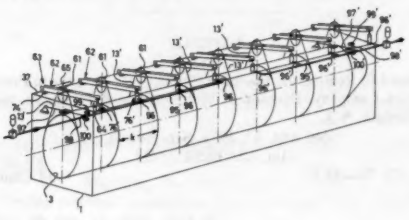
1. In a circular knitting machine, a rotating needle cylinder, a pneumatic tensioning duct along which an air current passes to tension an article being knitted, said duct comprising a rotating portion, a flexible textile net defining a tubular framework in the rotating portion of the tensioning duct, said net framework being deformable between a constricted state whereby it intercepts the article under formation and a relaxed state whereby it permits the knitted article to pass therethrough, and means operable to constrict the framework so that it intercepts the article under formation while the air current is maintained through the framework.

4,287,730

BEARING SUPPORT FOR A WASHING MACHINE DRUM

Heinz L. Grunewald, Bremen, and Jurgen Wellbrock, Lilienthal, both of Fed. Rep. of Germany, assignors to Engelhardt & Förster, Bremen, Fed. Rep. of Germany

Filed Jan. 12, 1979, Ser. No. 3,396
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801381
Int. Cl.[3] D06F *21/04, 37/22*
U.S. Cl. 68—140 **13 Claims**



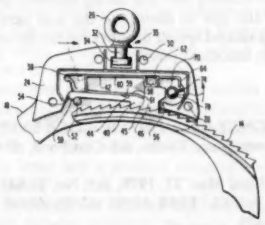
1. A bearing system in a tubular-type washing machine, comprising a substantially horizontal elongated drum, a plurality of buffers distributed in spaced-apart relation along the drum and connected to the drum and supporting it in suspension, each of such buffers including a piston-cylinder unit, means supplying a fluid pressure medium to the cylinders, each piston-cylinder unit having means therewith rendering it adjustable to load variation by the response of the piston to the pressure of the fluid pressure medium in the cylinder, and the cylinder of any one of the buffers being in flow interconnection with the cylinder of a second of the buffers.

4,287,731

HANDCUFFS

James B. Kruger, Oxford, Conn., assignor to Bangor Punta Corporation, Greenwich, Conn.

Filed Dec. 7, 1979, Ser. No. 101,388
Int. Cl.[3] E05B *75/00*
U.S. Cl. 70—16 **6 Claims**



1. A handcuff comprising:

a generally arcuate cheek carrying a lock assembly at one end,

a generally arcuate jaw having teeth at one end,

means for pivotally coupling said cheek and said jaw one to the other at their respective opposite ends to enable relative pivotal movement of said cheek and said jaw toward and away from one another between handcuff closed and open positions, respectively,

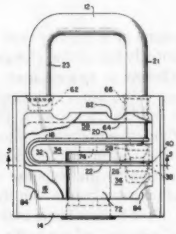
said lock assembly including a bolt having teeth and movable between a locking position with its teeth engaging the teeth carried by said jaw to prevent relative movement of said cheek and said jaw away from one another toward the handcuff open position and an unlocking position with its teeth spaced from the teeth carried by said jaw to enable relative movement of said cheek and said jaw away from one another toward the handcuff open position, a bolt spring carried by said lock assembly for biasing said bolt for movement toward its locking position, and means adjacent an end of said bolt for mounting said bolt for pivotal movement between said locking and unlocking position, said mounting means including a stud extending in a direction parallel to the pivotal axis of said bolt and a frame having a curved wall in spaced opposition to said stud, said bolt end having an enlarged portion between the engaging said wall and said stud and providing the sole means for pivotally coupling said bolt in said handcuff.

4,287,732

PADLOCK

Richard C. Remington, Pompton Plains, N.J., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Garfield, N.J.

Filed Aug. 27, 1979, Ser. No. 70,101
Int. Cl.³ E05B *27/22*
U.S. Cl. 70—38 C **14 Claims**



1. A padlock comprising a shackle, a case to receive the shackle, the shackle being movable within the case between locked and unlocked positions, a first elongated, substantially flat spring member confined within an elongated slot in the case with the plane of the first spring member and the slot being substantially perpendicular to the direction of movement of the shackle, the first spring member having an end portion engageable with the shackle for preventing movement of the shackle to unlocked position and having means cooperable with a key for moving said first spring member laterally within the plane of the slot to disengage the end portion from the shackle, and a second spring member within the case for urging the shackle to unlocked position.

4,287,733

MAGNET-ELECTRONIC LOCK SYSTEM

Mariano Gomez-Olea, Vuelta del Castillo 3, 5°A, Pamplona, Spain

Filed Mar. 27, 1979, Ser. No. 24,443
Int. Cl.³ E05B *19/00, 47/00, 49/00*
U.S. Cl. 70—276 **8 Claims**

1. A lock system comprising:

an elongated key extending along a key axis and having

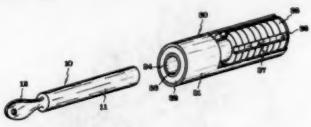
a stack of axially succeeding disks only some of which are formed with radially outwardly open recesses,

respective permanent magnets in some of said recesses and spaced axially and angularly apart in a predetermined magnet array relative to said key axis, and

a nonmagnetic sleeve surrounding said disks and retaining said magnets in the respective recesses;

a cylinder formed by a stack of axially succeeding rings some of which are formed with radially open recesses and which together define a passage generally complementary to said key and extending along a passage axis;

a plurality of magnetic detectors spaced axially and angularly apart in said recesses of said cylinder relative to said passage axis in a detector array generally complementary to said magnet array, each detector being capable of



changing state on juxtaposition with the respective magnet;

an openable latch; and

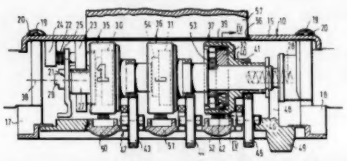
electronic circuit means connected between said latch and said detectors for opening said latch when all of said detectors have changed state on juxtaposition with the respective magnets of said key.

4,287,734

COMBINATION LOCK MECHANISM

Leslie V. Herriott, 31, Forton Close, Compton Ridge, Wolverhampton, England

Filed May 17, 1979, Ser. No. 39,753
Claims priority, application United Kingdom, May 18, 1977, 20824/77
Int. Cl.³ E05B *63/00*
U.S. Cl. 70—333 A **9 Claims**



1. In a lock mechanism comprising an operating member which, in use, normally imposes a constraint on an associated device but can undergo releasing movement to discontinue the constraint and a plurality of settable members, each of which can be set by an operator in a selected one of a number of alternative positions, it being necessary for the operator to establish a releasing combination of respective positions of the settable members before releasing movement of the operating member can occur, and further comprising indicating means for indicating visually to a user the respective positions to which the settable members have been set, the improvement comprising means for obscuring the indicating means, said means for obscuring and the indicating means being arranged for relative movement and means actuated by releasing movement of said operating member for causing relative movement between said obscuring means and said indicating means, whereby said indicating means is obscured.

4,287,735

KEY ASSEMBLY FOR CODED SECURITY SYSTEM

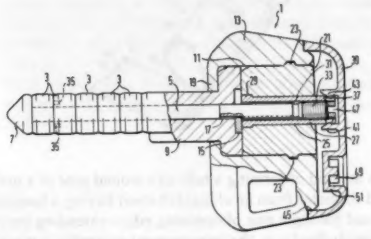
Gerd Brunken, Dittelbrunn, and Rupert Stangl, Oberwerrn, both of Fed. Rep. of Germany, assignors to Sachs Systemtechnik GmbH, Fed. Rep. of Germany

Filed Oct. 30, 1979, Ser. No. 89,467

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1978, 7833265[U]

Int. Cl.³ E05B *19/04, 19/18*

U.S. Cl. 70—395 **7 Claims**



1. A key assembly particularly for operating a coded security system comprising: a plurality of information carrier members mounted on said key assembly and adapted to be arranged in a predetermined pattern for defining an operating code of said security system; a grip portion; a longitudinal member having said information carrier members rotatably supported thereon; a head portion on said longitudinal member cooperating with said grip portion for fixedly holding said information carrier members in place on said longitudinal member; means mounting said longitudinal member in said grip portion for axial nonrotational movement relative thereto; means defining a threaded portion on said longitudinal member; and a threaded sleeve member accessible from outside said grip portion threadedly engaging said threaded portion of said longitudinal member, said sleeve being axially fixed relative to said grip portion but rotatable relative thereto about an axis parallel to the direction of axial movement of said longitudinal member; said sleeve being operative to move said longitudinal member relative to said grip portion to enable loosening of the fixed engagement of said information carrier members for reorganizing the predetermined pattern thereof when it is desired to change said operating code; said grip portion including a main body, said key assembly further including an insert held in a locked manner in a recess of said main body by means of locking members, said sleeve carrying on its end facing toward said information carrier members a radially projecting flange, with said sleeve being rotatably arranged in a bearing opening of said insert, said flange being axially fixed between a pair of opposing stop faces defined within said grip portion.

4,287,736

KEY RING CLIP LOCK FOR PUMP HANDLES

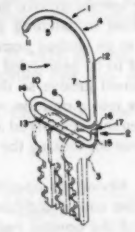
Gregory S. Hadgis, 14078 Zaremba Dr., Brookpart, Ohio 44142

Filed Apr. 23, 1979, Ser. No. 32,296

Int. Cl.³ A47G *29/10*

U.S. Cl. 70—458 **20 Claims**

1. A key ring clip lock apparatus for pump handles and their plungers, or the like, comprising holding means for directly holding keys or the like, said holding means including a resiliently deformable portion for permitting opening of said holding means to receive and to remove keys or the like; and clip means cooperative with said holding means for holding the apparatus to a gas pump handle and for confining between said holding means and said clip means at least a portion each of the pump handle and of the plunger thereof in an automatic pumping positional mode normally to retain the plunger in such mode.



4,287,737

LOCK USING NON-ROTATING PERFORATED PLATE KEY

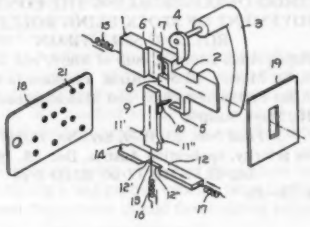
Byung D. Ahn, 130-109 Sooyu-Dong, Dobong Ku, Seoul, Rep. of Korea

Filed Sep. 21, 1979, Ser. No. 77,820

Claims priority, application Rep. of Korea, Sep. 23, 1978, 2902/78; Sep. 23, 1978, 2903/78

Int. Cl.³ E05B *55/04, 21/00*

U.S. Cl. 70—467 **7 Claims**



1. In a locking arrangement including a lock mechanism and a slidable non-rotating perforated key plate for operating the lock mechanism, said locking mechanism comprising:

a slidable lock bolt having a first groove therein adapted to receive a part of a swingable handle for controlling slidable displacement of the lock bolt along a first direction from a latching position into an unlatched position, said latch bolt also having a second groove formed therein and extending along a second direction which is transverse with respect to said first direction;

a support member slidably supported within said second groove adjacent one side edge thereof and being slidably displaceable longitudinally therealong, and a spring coacting between the lock bolt and said support member for urging the latter into a position adjacent one end of said second groove;

an elongated control rod slidably supported for movement along said second direction between a first position wherein one end of the control rod is engaged within the second groove and a second position wherein the one end of the control rod is withdrawn from the second groove and is thus disengaged from the lock bolt, said control rod having a projecting cam portion associated therewith;

said lock bolt having an L-shaped cam portion projecting sidewardly therefrom and being engageable with the projecting cam portion associated with the control rod when the lock bolt is moved toward its unlatched position for movably displacing the control rod away from said

second position so that the end of the control rod is moved into said second groove, the end of said control rod engaging and causing displacement of said support member against the urging of its spring when the control rod moves into the second groove and the lock bolt is displaced away from its latching position, said lock bolt when returned to its latched position causing said end of said control rod to be positioned adjacent the other side edge of said second groove so that the spring urges the support member into a position wherein it is sidewardly disposed between the control rod and said one side edge of the second groove for locking the lock bolt in its latching position; and

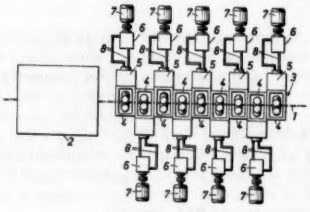
an operating rod having an opening therein for slidably receiving the other end of said control rod for controlling the movement of the control rod from its first position toward its second position, said operating rod being slidably displaceable along a third direction which extends transversely relative to said first direction, said operating rod being normally urged into a holding position wherein the operating rod engages the control rod and maintains it in said first position, said operating rod having a protrusion on one end thereof which, when engaged with an appropriate recess formed on the key plate, permits the operating rod to be moved into a release position wherein it disengages the control rod so that the latter is automatically moved into said second position so as to unlock the lock bolt.

4,287,738

METHOD OF CONTROLLING THE CONTINUOUS MOVEMENT OF STOCK BEING ROLLED IN A ROLLING MILL TRAIN

Hans Hojas; Alois Leutgöb, both of Steyr, and Johann Gsottbauer, St. Martin, all of Austria, assignors to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H., Steyr, Austria

Filed Nov. 20, 1979, Ser. No. 96,040
Claims priority, application Austria, Dec. 18, 1978, 9003/78
Int. Cl.[3] B21B *37/00;* **B21D** *5/14*
U.S. Cl. 72—20 **3 Claims**



1. A method of controlling the continuous movement of stock to be rolled through a series of rolling mill stands, comprising

driving the rolls of each of said stands by a hydraulic turbine,

operating a variable displacement pump to apply hydraulic pressure to each of said turbines to operate the same at an infinitely variable speed,

detecting any change of said hydraulic pressure applied to the turbine which drives a preceding one of said stands in response to the initial passing of said stock through the succeeding one of said stands, and

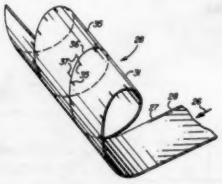
adjusting the displacement of the variable displacement pump which operates the turbine which drives said succeeding stand to correct the speed of the turbine which drives said succeeding stand to compensate the change of the hydraulic pressure which has thus been detected.

4,287,739

METHOD FOR PRODUCING A HELICALLY WOUND PIPE HAVING A PREDETERMINED DIAMETER

George L. Campbell, Scottsdale, Ariz., assignor to Syracuse Tank & Manufacturing, Phoenix, Ariz.

Filed Mar. 26, 1979, Ser. No. 23,585
Int. Cl.[3] B21C *51/00, 37/12*
U.S. Cl. 72—34 **6 Claims**



1. In a method of forming a helically wound pipe of a predetermined diameter from an elongated sheet having a longitudinal axis and having a pair of opposing edges extending parallel to said longitudinal axis, the improvement comprising: marking said elongated sheet adjacent said opposing edges thereof with indicia at predetermined spaced intervals, said indicia so marked extending perpendicular to said longitudinal axis; feeding said elongated sheet in a direction parallel to its axis; helically winding said elongated sheet to form a helically wound pipe having adjoining revolutions, and during said winding maintaining the diameter of said helically wound pipe equal to said predetermined diameter by maintaining a predetermined distance, parallel to said longitudinal axis, between indicia adjacent the edge of one revolution and the indicia adjacent the edge of an adjoining revolution.

4,287,740

METHOD OF INCREASING THE FATIGUE LIFE OF TITANIUM ALLOY PARTS

Arun Kumar, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 12, 1978, Ser. No. 941,703
Int. Cl.[3] B24C *1/10;* **B22F** *1/18;* **B21C** *43/00*
U.S. Cl. 72—40 **8 Claims**

1. A method of increasing the fatigue life of a part made of titanium alloy, which comprises subjecting the part to the steps of first abrasive cleaning and thereafter shot peening, said abrasive cleaning comprising blasting the surface of said part with particles having a diameter within the range of about 0.0024 to 0.0082 inches at a blast pressure within the range of about 10 to 50 p.s.i., said step of shot peening using a higher intensity and larger particle size than said step of abrasive cleaning.

4,287,741

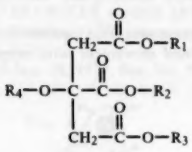
LUBRICATED TINPLATE FOR DRAWING AND IRONING OPERATION

Gordon L. Peters, Weirton, W. Va., and John R. Smith, Richmond, Ohio, assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Oct. 9, 1979, Ser. No. 82,877
Int. Cl.[3] B32B *15/04*
U.S. Cl. 72—42 **14 Claims**

1. In the drawing and ironing of tinplate stock wherein the stock material is provided with a lubricant coating prior to the drawing or cupping stage, the improvement comprising

applying to the pre-drawn stock a substantially uniform film of lubricant consisting essentially of a citric acid ester having the structural formula



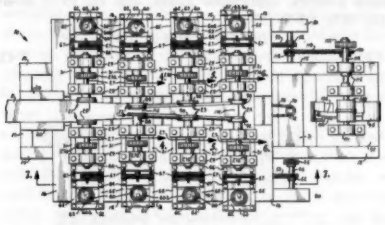
wherein R_1, R_2 and R_3 are individually selected from the group consisting of hydrogen and alcoholic residue containing 1–10 carbon atoms, R_4 is selected from the group consisting of hydrogen and carbocylic acid radicals containing 1–10 carbon atoms, and at least one of R_1, R_2 and R_3 is an alcoholic residue, the citric acid ester being present in a coating weight amount of at least 1.8 grams per basebox.

4,287,742

MACHINE FOR FORMING CURVED CONDUITS

John H. Heiman, 3407 W. Coleman Rd., Kansas City, Mo. 64111

Filed Sep. 6, 1979, Ser. No. 72,881
Int. Cl.³ B21C *37/12*
U.S. Cl. 72—49 **14 Claims**



1. A machine for forming a curved conduit from a continuous strip of sheet material, said machine comprising:

a frame;

means for advancing said strip along said frame in a preselected path;

a cutting mechanism mounted on said frame at a location along said path, said cutting mechanism including cutters movable toward and away from one another in directions transverse to said path and operable to cut said strip in a manner to form contoured opposite side edges thereof which are shaped to abut one another and provide a conduit having an arcuate axis when said strip is spirally wound;

winding means located downstream of said cutting mechanism along said path for spirally winding said strip in a manner to position the opposite side edges thereof adjacent one another; and

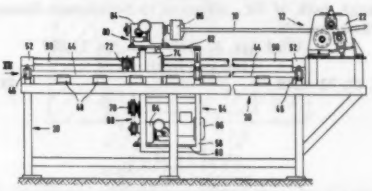
means for securing the adjacent side edges of said strip to one another, thereby securing said strip in the shape of a curved spirally wrapped conduit.

4,287,743

METHOD AND DEVICE FOR THE MANUFACTURE OF HELICAL ROTOR BLANKS FOR HELICAL GEAR MACHINES

Günther Hantschk, Waldkraiburg, Fed. Rep. of Germany, assignor to Netzsch-Mohnopumpen GmbH, Fed. Rep. of Germany

Filed Feb. 22, 1979, Ser. No. 14,187
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2808081
Int. Cl.³ B21D *11/06*
U.S. Cl. 72—98 **10 Claims**



1. Apparatus for the manufacture of helical rotor blanks for helical gear machines from a straight cylindrical shaft by longitudinal movement of the shaft along the shaft axis and rotation of the shaft around the shaft axis while bending the shaft comprising

a clamping chuck for holding an end of the shaft and having means to rotationally actuate and translate said chuck in the direction of the axis of the shaft connected thereto,

a forming tool positioned to receive the shaft from the opposite end of the shaft,

said forming tool including

at least three bending rollers, the axes of which extend at least approximately at right angles to the shaft axis,

a first bending roller of said at least three bending rollers, being the first reached by the shaft in its longitudinal movement, having a ring groove located for guiding the shaft,

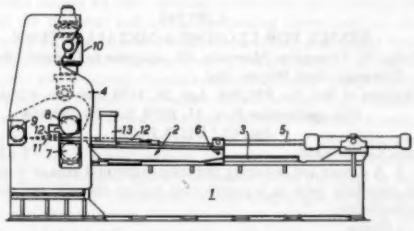
a second bending roller of said at least three bending rollers having a ring groove which is laterally displaced from said ring groove of said first bending roller.

4,287,744

TAPER ROLLING MACHINE

Edward J. Furness, Sheffield, and Philip Wade, Barnsley, both of England, assignors to British Steel Corporation, London, England

Filed Sep. 10, 1979, Ser. No. 74,169
Claims priority, application United Kingdom, Sep. 19, 1978, 37325/78
Int. Cl.³ B21B *1/42*
U.S. Cl. 72—214 **10 Claims**



1. Apparatus for taper rolling a length of stock comprising a roll head having a pair of idler rolls defining a roll gap therebetween; a carriage for gripping the stock and drawing it through the rolls in a multiplicity of passes whilst the roll gap is con-

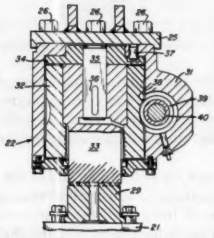
trolled to impart the taper; adjustment means to adjust the roll gap by effecting movement of only one of the idler rolls in a direction perpendicular to the movement of the stock; and, resilient mounting means attached to said carriage for resiliently mounting it for movement in a direction perpendicular to the movement of the stock so as to maintain a substantially constant pass line through the stock throughout the taper rolling thereof.

4,287,745

ROLLING MILL SCREWDOWN

Wilhelm Fuhrmann, Wexford, and Andrew J. Sofranko, Pittsburgh, both of Pa., assignors to Schloemann-Siemag, Inc., Pittsburgh, Pa.

Filed Apr. 20, 1979, Ser. No. 31,887
Int. Cl.³ B21B *31/24*
U.S. Cl. 72—248 **18 Claims**



1. A rolling mill including spaced-apart mill housings each having a window to receive and support a bearing chock on one of the ends of each of at least a pair of rolls for processing workpieces, the combination therewith of:

screwdown housing means extending within the windows of the mill housings for independent support between the bearing chocks of one roll and the mill housings,

nut members carried by the screwdown housing means,

a pair of screws each threadedly engaged with one of said nut members,

means carried by the screwdown housing means for producing relative rotation between the screws and nut members,

locking means supported by the screwdown housing means for linear constrained displacement of the pair of screws relative to the nut members by relative rotation therebetween, and

fastening means for releasably attaching the screwdown housing means on the mill housings within the windows thereof independently of said bearing chocks such that the nut members and the screws extend between the chocks of one roll and the mill housings for adjustably positioning one roll relative to the other roll.

4,287,746

DEVICE FOR CLOSING A METALLIC TUBE

Paige W. Thompson, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 899,596, Apr. 24, 1978, Pat. No. 4,204,378. This application Nov. 13, 1979, Ser. No. 93,664
Int. Cl.³ B21D *37/10*
U.S. Cl. 72—338 **5 Claims**

1. A device for reducing the cross-sectional area of a metallic capillary tube in a preselected region thereof, the device comprising:

a frame;

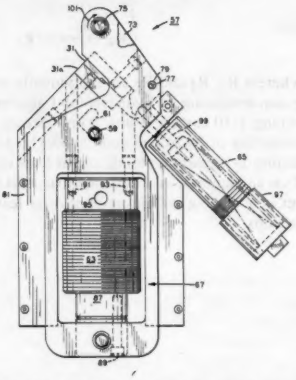
a first die pivotally mounted on said frame;

a slide member arranged with said frame so as to be movable with respect thereto;

a second die on said slide member;

means coupled with said slide member and said frame for predeterminately defining the movement of said slide member;

means for actuating said slide member through its predeterminately defined movement with respect to said frame; and



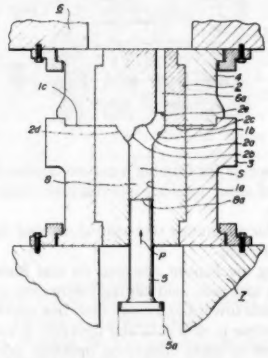
means movable with said slide member at least during a part of the defined movement thereof for pivoting said first die toward said second die when the slide member moves the second die toward said first die.

4,287,747

PROCESS OF CLOSED EXTRUSION SHAPING OF A METAL ROD MATERIAL AND AN APPARATUS THEREFOR

Hajime Koshimaru, Machida, and Shohju Ishii, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 16, 1979, Ser. No. 57,850
Claims priority, application Japan, Jul. 18, 1978, 53-86714; Jul. 18, 1978, 53-86715
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—358 **7 Claims**



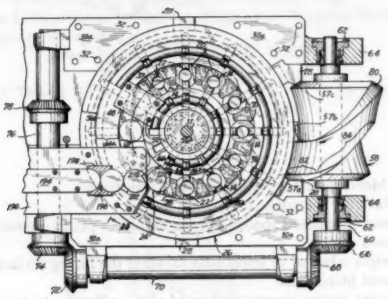
1. A process for manufacturing parts having yokes with two or more body portions from a metal solid rod material by extrusion shaping, which comprises pressing a solid metal rod material from one end into a chamber formed by two opposing dies, with the other end of the rod being urged into contact with an impression and associated projecting portions formed in one of said dies to divide the rod material into two or more body portions which are then extruded into cavities which are in communication with said chamber and which extend in the said one die parallel to the pressing direction.

4,287,748

ROTARY TRANSFER PRESS APPARATUS

Maurice Wolfthal, Ossining, N.Y., assignor to Stewart Stamping Corp., Yonkers, N.Y.

Filed Sep. 28, 1979, Ser. No. 79,968
Int. Cl.³ B21D 43/14; B21K 27/00
U.S. Cl. 72—405 21 Claims



1. Rotary transfer press apparatus wherein each of a plurality of workpieces is sequentially transferred to a plurality of successive working stations so that the workpiece is successively formed to obtain a finished product, comprising:

a fixed die block having a plurality of successive working stations arranged along a substantially circular path, which working stations are adapted to perform corresponding successive working operations on a workpiece which is transferred along said circular path through said working stations to obtain a finished product subsequent to the last of the forming operations, each of said working stations including a die member into which each of a plurality of workpieces is brought into operative relation for performance of one of the successive forming operations;

a vertically reciprocatable upper press platen located over said die block having a plurality of punches, each of which extends coaxially with respect to the die member associated with a corresponding working station in said fixed die block, said punches having lower working end regions adapted to enter into and withdraw from said die members in corresponding working stations at substantially the same time during each reciprocating cycle of said upper press platen;

said upper press platen being adapted for vertical reciprocation so that said punches continuously cycle at a certain rate, each punch cycle including a downward stroke portion wherein said upper press platen travels from top dead center to bottom dead center and an upward stroke portion wherein said press platen travels from bottom dead center to top dead center; and

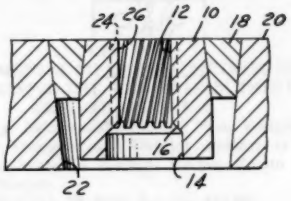
means for sequentially transferring the plurality of workpieces simultaneously along said substantially circular path in a manner such that each workpiece is sequentially carried to each of the successive working stations where corresponding successive forming operations are performed thereon, said transfer means advancing each workpiece from one working station where a forming operation has been performed thereon during a press cycle to the next successive working station in preparation for the next successive forming operation to be performed during the immediately subsequent press cycle.

4,287,749

TAPERED EXTRUSION DIE AND METHOD OF FORMING THE SAME

Benjamin I. Bachrach, Dearborn, and William J. Fuhrman, Bloomfield Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 15, 1979, Ser. No. 94,629
Int. Cl.³ B21C 25/08
U.S. Cl. 72—467 14 Claims



1. A die adapted to form an extrusion made by the method comprising the steps of:

elastically contracting the transverse size of a die blank by an amount of contraction that varies continuously along at least a portion of the length of the die;

forming a hole through the die blank; and

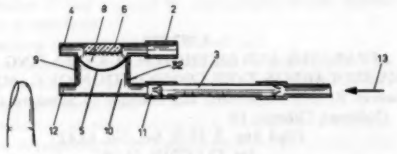
releasing the elastic contraction of the die blank.

4,287,750

DEVICE FOR CHECKING THE FUNCTIONING OF GAS MEASURING APPARATUS

Wolfgang Eckstein, Sereetz, and Horst Rabenecker, Klein Parin, both of Fed. Rep. of Germany, assignors to Drägerwerk AG, Lübeck, Fed. Rep. of Germany

Filed Oct. 4, 1979, Ser. No. 81,792
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843651
Int. Cl.³ G01N 1/22, 31/00
U.S. Cl. 73—1 G 2 Claims

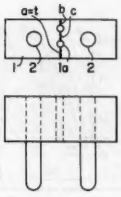


1. A device for optically checking the operability of a gas measuring apparatus, the gas measuring apparatus being of the type having a flow passage for passing a gas to be tested therethrough at a low rate of flow, comprising a housing defining a chamber having an inlet opening connection for receiving the gas in the chamber and an outlet opening connection for discharging the gas from said chamber, a spring diaphragm flexibly mounted in said chamber to divide said chamber into a first chamber and a second chamber, said diaphragm being flexible responsive to pressure variation between said first chamber and said second chamber, said inlet and outlet opening connections being in communication with said first chamber, said housing having a wall portion adjacent to said first chamber defining an aperture, and a translucent sheet mounted in said aperture to permit observation of said diaphragm through said sheet and first chamber from the outside of said housing, said housing having a wall portion adjacent to said second chamber with a second chamber opening for establishing communication between said second chamber and atmosphere, color indication means on the side of said spring diaphragm adjacent said first chamber, and said outlet opening connection including means for fluid communication with the flow passage.

4,287,751
GAS DETECTOR

Eturo Yasuda; Yoshihiro Segawa, both of Okazaki, and Minoru Ohta, Anjo, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 8, 1978, Ser. No. 958,681
Claims priority, application Japan, Nov. 9, 1977, 52/134259
Int. Cl.[3] G01N *27/04*
U.S. Cl. 73—23 24 Claims

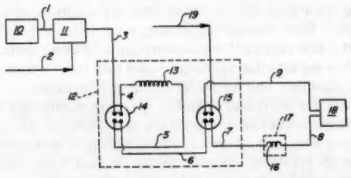


1. A gas detector comprising a gas detector element made of a sintered material of a metal oxide exhibiting an electric resistance corresponding to a gas to be detected, and a pair of parallel electrodes spaced from each other for measuring the electric resistance exhibited by said gas detector element, each of said parallel electrodes having an end thereof embedded in said gas detector element, said gas detector element having opposite side surfaces between which are at least two through holes located between and parallel to said pair of electrodes at different distances from said side surfaces respectively, a thickness of 0.1 to 0.6 mm being given to the larger one of the sintered metal oxide portions existing between said through holes and the side surfaces of said plate.

4,287,752
APPARATUS AND METHOD FOR ANALYZING THE HYDROCARBON TYPE COMPOSITION OF GASOLINE

George B. Ury, Naperville, Ill., assignor to Standard Oil Co. (Indiana), Chicago, Ill.

Filed Aug. 3, 1979, Ser. No. 63,427
Int. Cl.[3] G01N *31/06*
U.S. Cl. 73—23.1 12 Claims

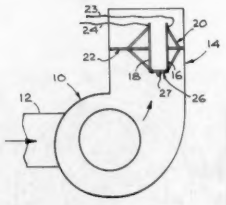


1. A method for separating olefins from saturates in a composition comprised of a number of olefins having between 5 and 12 carbon atoms and saturates which comprises:
(a) passing said composition into contact with a copper on silica gel composition whereby said olefins are adsorbed while said saturates pass through; and
(b) thereafter heating said copper on silica gel composition to release said olefins.

4,287,753
AUTOMATIC MOISTURE CONTROLLER WITH STACK SENSOR

Frederick W. Grantham, 12055 Goshen Ave., Los Angeles, Calif. 90049

Filed Jul. 24, 1980, Ser. No. 172,083
Int. Cl.[3] G01N *27/04*; F26B *21/08*
U.S. Cl. 73—29 13 Claims

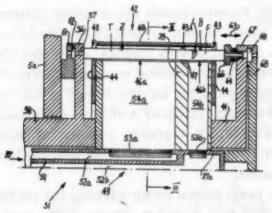


1. Moisture detecting apparatus comprising:
a duct for the passage of moist air;
a pair of opposed spaced-apart conductive plates mounted in said duct;
a wiper adapted to selectively traverse the facing surfaces of said plates; and
sensing means connected to said plates effective to measure the resistance between the plates and provide an indication of relative humidity of the air between the plates.

4,287,754
APPARATUS FOR AND METHOD OF MULTIPLE TESTING OF WRAPPERS OF CIGARETTES OR THE LIKE

Uwe Heitmann, Schwarzenbek; Heinz-Christen Lorenzen, Hamburg; Günter Wahle, Reinbek, and Rolf Dahlgrün, Schwarzenbek, all of Fed. Rep. of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 852,963, Nov. 18, 1977, abandoned. This application May 29, 1980, Ser. No. 154,291
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653734
Int. Cl.[3] G01N *15/08*
U.S. Cl. 73—38 22 Claims



1. A method of testing the wrappers of cigarettes or analogous rod-shaped articles which constitute or form part of smoker's products, comprising the steps of measuring, with a first degree of accuracy, the permeability of a first portion of the wrapper of each of a series of successive articles; measuring, with a higher second degree of accuracy, the permeability of a second portion of the wrapper of each of said series of articles, said second portion of the wrapper having air admitting holes therein, said first mentioned measuring step including establishing a first pressure differential between the interior and exterior of successive first wrapper portions and said last mentioned measuring step including establishing a different second pressure differential between the interior and exterior of successive second wrapper portions; generating a succession of first signals having characteristics denoting the measured

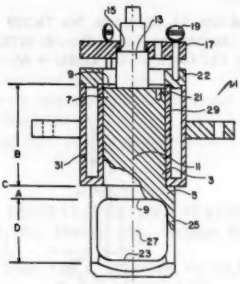
permeabilities of first and second portions of wrappers of successive articles; comparing each of said first signals with a first reference signal denoting the maximum permissible permeability of said wrappers; and comparing each of said first signals with a second reference signal denoting the minimum acceptable permeability of said wrappers.

4,287,755

PROBES FOR THE ULTRASONIC TREATMENT OR INSPECTION OF MOLTEN ALUMINUM

Thomas L. Mansfield, Louisa, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sep. 12, 1979, Ser. No. 74,800
Int. Cl.[3] G01N *29/02*
U.S. Cl. 73—61 R 19 Claims



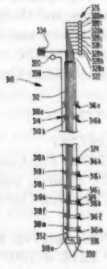
1. An improved probe for conducting ultrasonic mechanical energy between a transducer device and an aluminum melt; where said probe comprises a working tip consisting of titanium, and a coating of aluminum which has been volatilized and deposited on said working tip in a vacuum; and said probe is further characterized in that upon the immersion of said working tip in an aluminum melt at temperatures up to about 850° C., said working tip is wetted by molten aluminum in about one minute or less.

4,287,756

STRATIFIED FLUID INTERFACE RECORDER

John J. Gallagher, 1000 Connecticut Ave., NW #1103, Washington, D.C. 20036

Filed Oct. 24, 1979, Ser. No. 87,737
Int. Cl.[3] G01F *23/00, 23/24*
U.S. Cl. 73—61.1 R 11 Claims



1. A device for determining the relative location of stratified fluids of different character when inserted through the stratified fluids comprising:

an elongated member having plural fluid character recording stations disposed therealong;

sensing means associated with each of said stations for determining the properties of the fluid proximate thereto when said probe is positioned through said fluids;

clearing means movably associated with each of said sensing means to preclude contamination thereof by fluid from other strata; and

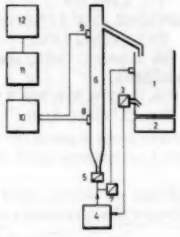
means to determine the fluid characteristics recorded by said stations.

4,287,757

INSTRUMENTAL MEASURING METHOD FOR DETERMINING THE SIZE-DISTRIBUTION OF GRAINED MATERIAL

György Bucsky, Balatonalmádi; Zoltán Kiss, Veszprem, and Lajos Tátrai, Veszprém, all of Hungary, assignors to Magyar Tudomanyos Akademia Muszaki Kemiai Kutato Intezet, Veszprém, Hungary

Filed Feb. 11, 1980, Ser. No. 120,060
Int. Cl.[3] G01N *15/04*
U.S. Cl. 73—61.4 3 Claims



1. An instrumental measuring method for determining the size distribution of grained material, comprising the steps of

inserting the material to be measured into a fluid so that the particles of said material be substantially evenly distributed in said fluid,

sedimenting the material in said fluid and

continuously measuring the difference of hydrostatic pressure between at least two height regions in said fluid during sedimentation,

by developing an electrical signal at each point of measurement in response to the hydrostatic pressure at that point without disturbing the sedimentation by physical sampling.

4,287,758

SHAFT MOUNTING DEVICE AND METHOD

Judson S. Swearingen, Malibu, Calif., assignor to Rotoflow Corporation, Inc., Los Angeles, Calif.

Filed Jul. 19, 1979, Ser. No. 58,859
Int. Cl.[3] G01L *5/12*
U.S. Cl. 73—862.49 13 Claims

1. A shaft mounting device comprising

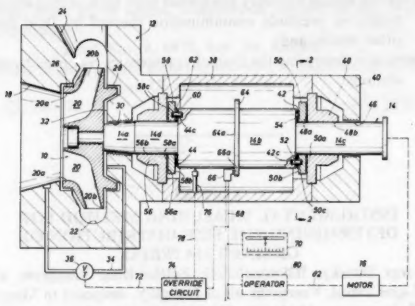
a housing;

two thrust bearing members fixed in said housing;

a shaft rotatably mounted in said thrust bearing members and being slideably disposed therein, said shaft including two radial surfaces thereon facing in opposite axial directions;

two thrust rings slideably disposed on said shaft adjacent said radial surfaces, said thrust bearing members each abutting one said thrust ring;

means for resiliently holding each said thrust ring spaced axially on said shaft from said radial surface; means fixed



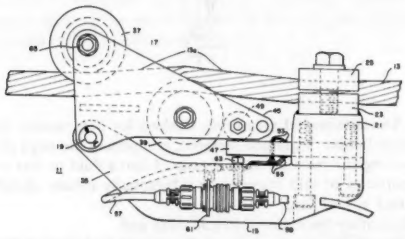
relative to said housing for sensing axial displacement of said shaft.

4,287,759

DEVICE FOR SENSING THE TENSION IN A LOAD CARRYING LINE

George W. Cooper, San Leandro, Calif., assignor to Fruehauf Corporation, Detroit, Mich.

Filed Feb. 6, 1979, Ser. No. 9,952
Int. Cl.³ G01L *5/10*
U.S. Cl. 73—862.45 **1 Claim**



1. An improved load sensing device adapted for attachment to a load carrying line comprising

a support frame having a clamping end adapted to fixably clamp to said load carrying line,

a load sensing unit fixed to said support frame, and

a rigid load line operator pivotally attached to said support frame in spaced relation to the clamping end thereof, said load line operator comprising

a torque transmitting end radially disposed from the pivot formed by the line operator's pivotal attachment to said support frame so as to react against the load sensing unit secured to said frame when torque is applied to said operator, and

first and second spaced apart load line bearing elements disposed to capture and deform a segment of the load carrying line threaded therebetween when said support frame is claimed to said load carrying line whereby the restoring forces of the deformed load carrying line exerted on said first and second load bearing elements of said operator cause a torque in said operator which urges the torque transmitting end thereof against said load sensing unit whereby the force applied to said load sensing unit is substantially proportional to the tension in the load carrying line threaded through said operator, and whereby said load sensing device is operatively held on said load carrying line due to the securement thereof by said load line operator and by the clamping end of said support frame,

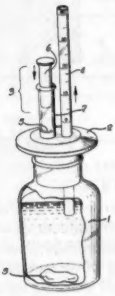
said load line operator being generally triangular in configuration, with the operator pivot, the first load line bearing element of the operator, and the torque transmitting end of the operator defining the corners of the triangle of said triangular configuration, and with said second load line bearing element being located within said triangle intermediate said operator pivot and the torque transmitting end thereof.

4,287,760

METHOD AND EQUIPMENT TO MEASURE FAT CONTENT OF MEAT

Shinji Kubo, Chiba, and Norio Yamada, Ichikawa, both of Japan, assignors to Chibayaku Groceries, Incorporated, Chiba, Japan

Filed Sep. 17, 1979, Ser. No. 76,309
Claims priority, application Japan, Dec. 4, 1978, 53-149089
Int. Cl.³ G01F *17/00*; G01N *9/10*
U.S. Cl. 73—149 **3 Claims**



1. In apparatus for measuring fat content of meat, the combination comprising

(a) a first container to receive liquid into which a meat sample is immersed when the meat sample is placed in the container, and

(b) means associated with the container for indicating the amount of displacement of the liquid by the meat sample, the variance of such displacement being a function of fat content to be determined, whereby the fat content can be determined from the detected displacement,

(c) said means including a liquid height gage communicating with the container interior, there being meat fat content calibration indicia vertically spaced on the gage to indicate fat content percentages, and there also being a piston pump on a lid for the container, said lid providing means via which liquid is accessed into the container, said height gage projecting upwardly through the lid to receive liquid displaced by the pump.

4,287,761

MUD SAMPLING CHAMBER

John N. Moffet, and John D. Moffet, both of Wichita Falls, Tex., assignors to Energy Detection Company, Wichita Falls, Tex.

Filed Jan. 24, 1980, Ser. No. 115,002
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—153 **10 Claims**

1. A drilling mud sampling chamber, which comprises:

a rigid box having front and back ends, and top and bottom sides;

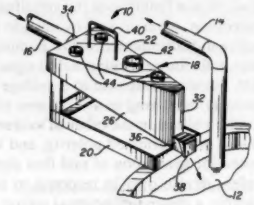
a handle secured to the top side of said box;

said box being of rectangular cross-section which increases in width and decreases in height from the back end of said

box to the front end thereof such that the bottom wall is inclined relative to the top wall of said box;

a sight glass mounted in an opening provided in the top side of said box;

a fitting mounted in another opening provided in the top side



of said box, said fitting being adapted for receiving a hydrocarbon sensor;

an inlet in the front of said box;

an outlet in the end of said box, said outlet being positioned beneath said inlet; and

a hinged trap door covering said outlet.

4,287,762

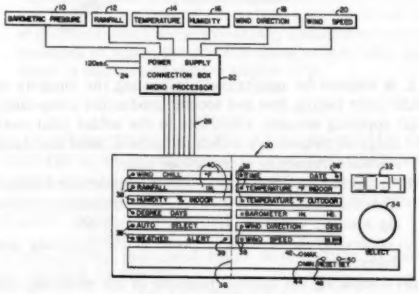
DIGITAL WEATHER STATION

John S. Baer, Bar Harbor, Me., assignor to Rainwise, Inc., Pitman, N.J.

Filed Aug. 6, 1979, Ser. No. 63,789

Int. Cl.³ G01W *1/04*

U.S. Cl. 73—170 R **18 Claims**



1. Digital readout gauge means having a rotatable shaft responsive to a condition sensing element for producing a reading of a condition sensed comprising:

a support means;

calibration means supported on and rotating with the rotating shaft in the form of a translucent member made from a photographic reproduction providing a mirror image of fixed calibrations used with a pointer on a rotatable shaft having the same analog positions as the shaft, the photographic reproduction providing a pattern of digital calibrations arranged concentric to the shaft whereby as the condition sensor means drives the shaft it drives the calibration means rotatably about the shaft;

optical reader means to detect calibration marks and absence of calibration marks as a digital calibration pattern and generate an output pattern representative of digital counts;

means to sense and interpret direction of movement;

up-down counter means having a selectable starting value and receiving impulses from the reader means to modify the starting value as counts are added or subtracted by impulses from the reader means in accordance with the sensed and interpreted direction of movement; and

digital display means connected to and displaying the count of the counter.

4,287,763

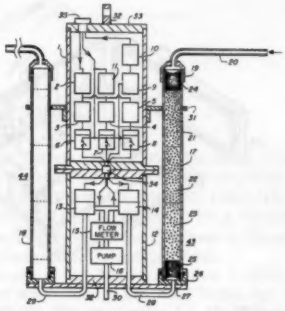
APPARATUS FOR CONCENTRATING AND SAMPLING SUBSTANCES FROM SEAWATER

Joseph D. Richard, 5590 SW. 78 St., Apt. A, Miami, Fla. 33143

Filed Aug. 13, 1979, Ser. No. 65,907

Int. Cl.³ G01N *1/10*

U.S. Cl. 73—863.21 **9 Claims**



1. Apparatus for obtaining a series of concentrated samples of trace substances from seawater in selected depths in the ocean comprising:

an instrumented body suitable for submersion in seawater; a signal cable for connecting said instrumented body with a surface vessel;

a plurality of sampling chambers arrayed around said instrumented body, each said sampling chamber having an inlet conduit and an outlet conduit; a porous material maintained within each of said sampling chambers for retaining and concentrating at least one substance occurring in seawater;

a plurality of electrically operated valves each for normally closing a selected one of the outlet conduits of one of said sampling chambers;

a pump connectable to the outlet conduit of any of said sampling chambers whenever corresponding said electrically operated valve is opened;

a flowmeter disposed to measure the seawater volume passing through a selected at least one of said sampling chambers which are open to said pump via a selected at least one of said valves;

remote control means operable from the aforementioned surface vessel for controlling said pump and a selected at least one of said electrically operated valves; and

remote indicating means operable adjacent said remote control means for totalizing and monitoring the volume of seawater measured by said flowmeter.

4,287,764

FLUID ANALYZER CONSTRUCTION AND HOUSING

Joachim Staab; Willy Apel, both of Frankfurt am Main, and Heinz Wolf, Kronberg, all of Fed. Rep. of Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,730

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908169

Int. Cl.³ G01D *11/24*; H05K *5/00*; G01R *1/04*

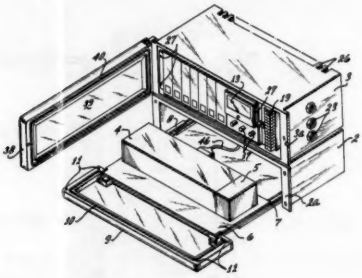
U.S. Cl. 73—431 **10 Claims**

1. In an analyzer arrangement for gas or liquid which includes an analyzer means, an indicating instrument, power

supply means, and electric circuit elements, a combination for mounting and assembly, comprising:

a first case and a second case, each having a front being open for access;

the first case including or containing (a) a carrier plate or tray mounted for insertion and retraction; (b) a door hinged to a front edge of the carrier plate about a horizontal axis, for sealingly closing the open front of the first case and bolting thereto when the plate is inserted in the first case, the door being capable of folding down into a horizontal position when the plate is pulled out, the analyzer means with preamplifier mounted on the plate to be contained in the first case when the plate is inserted;



the second case containing (a) the power supply means mounted inside the second case; (b) a frame in the second case for holding the instrument and a plurality of printed circuit boards for said circuit elements; (c) means for slideably and hingedly positioning the frame in the second case to permit full access of a rear of the frame; and (d) a door hinged to the second case for sealingly closing and bolting to the second case; and

electrical connection means including a removable or disconnectable portion for connecting the analyzing means in the first case to circuit elements on the boards in the second case.

4,287,765

ACCELEROMETER AND EVALUATION CIRCUIT

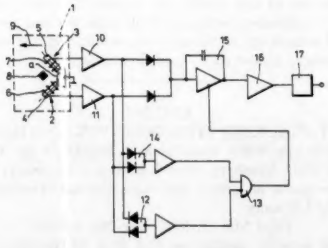
Wolfgang Kreft, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,471

Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920147

Int. Cl.³ G01P *15/08;* B60R *21/08*

U.S. Cl. 73—517 R **5 Claims**



1. The combination of an accelerometer and an evaluation circuit connected thereto for controlling a safety device in an automobile, wherein said accelerometer comprises:

a pair of electromagnetic circuits arranged at an angle other than 180° relative to each other and each having a sensor coil;

a movable member, arranged to be inertially deflectable by acceleration forces applied to said accelerometer, and including means for inducing electrical voltages in the individual electromagnetic circuits, said voltages having a magnitude which is a function of the amplitude and direction of acceleration, wherein said evaluation circuit comprises directional discriminator means connected to each of said sensor coils for generating a first signal for actuating the safety device in response to a voltage with predetermined polarity occurring in at least one of said sensor coils, where the voltage in the other of said sensor coils is zero or has said predetermined polarity, and wherein said angle is chosen for generation of said first signal for actuating the safety device only in response to accelerations occurring within a desired directional sector.

4,287,766

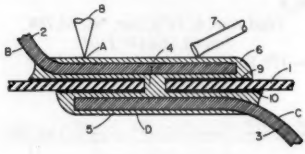
INSPECTION OF SOLDER JOINTS BY ACOUSTIC IMPEDANCE

Dale Ensminger, Columbus, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Sep. 26, 1979, Ser. No. 78,958

Int. Cl.³ G01H *13/00*

U.S. Cl. 73—582 **7 Claims**



1. A method for qualitatively inspecting the integrity of a solder joint joining first and second conductors comprising

(a) applying acoustic vibrations to the solder joint over a range of frequencies which includes at least one natural resonant frequency of the solder joint,

(b) receiving the acoustic vibrations, as modulated thereby, from the solder joint with a receiving transducer converting acoustic vibrations into electrical signals,

(c) observing the spectral response of the receiving transducer, and

(d) comparing the spectral response of the receiving transducer with previously determined spectral responses characteristic of either unacceptable or acceptable solder bonds whereby to determine the acceptability of the solder bond.

4,287,767

ULTRASONIC SECTION SURFACE EXAMINATION EQUIPMENT

Carl Kretz, Zipf, Austria, assignor to Kretztechnik Gesellschaft m.b.H., Zipf, Austria

Filed Nov. 13, 1979, Ser. No. 93,049

Claims priority, application Austria, Jan. 25, 1979, 522/79

Int. Cl.³ G01N *29/00*

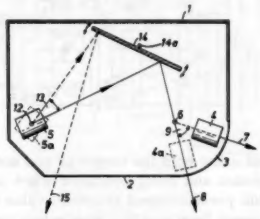
U.S. Cl. 73—625 **20 Claims**

1. Ultrasonic section surface examination equipment, comprising

a scanning unit which defines a plurality of sound paths and comprises first and second sound transducer heads, each of which comprises at least one sound transducer that is operable to project a sound beam along an associated one of said sound paths into a section surface of an object to be examined and to receive echo signals generated in said

section surface in response to said sound beam and to derive echo signals from the echoes thus received,

scanning mechanism means for mechanically operating said scanning unit so as to move said sound paths transversely to themselves in said section surface in coordinated movements whereby the sound beam projected from a sound transducer of said first sound transducer head is caused to scan said section surface in a first section surface area having substantially divergent side edges and the sound beam projected from a sound transducer of said second sound transducer head is caused to scan said section surface in a second section surface area which is adjacent to said first area and has side edges which are less divergent than those of said first area, and



display means comprising a fluorescent screen and operable to display said echoes on said fluorescent screen in response to echo signals from said sound transducer of said first sound transducer head in a first screen area at locations which are geometrically coordinated with the locations at which the corresponding echoes have originated in said first section surface area and, at the same time, in response to echo signals from said sound transducer of said second sound transducer head in a second screen area at locations which are geometrically coordinated with the locations at which the corresponding echoes have originated in said second section surface area.

4,287,768

BEAM DEFLECTION METHOD AND APPARATUS FOR SECTOR SCAN ULTRASOUND IMAGING SYSTEMS

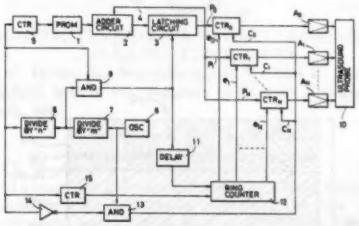
Yoshihiro Hayakawa, and Hiroshi Fukukita, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Nov. 9, 1979, Ser. No. 93,019

Claims priority, application Japan, Nov. 13, 1978, 53-140281; Aug. 13, 1979, 54-103042

Int. Cl.[3] **G01N** *29/00*

U.S. Cl. 73—626 **17 Claims**



1. A method for successively deflecting an ultrasound beam at different angles to provide a sector scan by successively activating piezoelectric transducer elements, comprising the steps of:

storing a set of delay time data in a memory, each said stored datum being provided for each said deflection angle of said ultrasound beam and representing a binary number corresponding to the delay time between successively activated transducer elements;

retrieving each said delay time data from said memory corresponding to each of said deflection angles;

repeatedly accumulating said retrieved data (N−1) times, where N is the number of said transducer elements, to generate an output data is succession for each said deflection angle; and

successively activating said transducer elements in response to said successively generated output data.

4,287,769

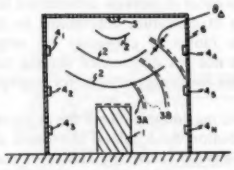
APPARATUS AND METHOD WHEREBY WAVE ENERGY IS CORRELATED WITH GEOMETRY OF A MANUFACTURED PART OR THE LIKE OR TO POSITIONAL RELATIONSHIPS IN A SYSTEM

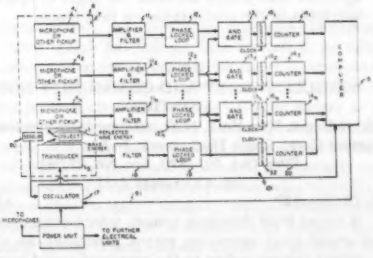
Bruce S. Buckley, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 911,622, Jun. 1, 1978, Pat. No. 4,200,921, which is a division of Ser. No. 679,262, Apr. 22, 1976, Pat. No. 4,095,475. This application Jul. 11, 1979, Ser. No. 56,577

Int. Cl.[3] **G01N** *29/00*

U.S. Cl. 73—627 **9 Claims**





1. Apparatus that comprises, in combination: source means directing acoustic wave energy upon an object that reflects the same, means for detecting the reflected wave energy and developing a signal θ_A therefrom, which signal θ_A bears a relationship to geometrical characteristics of the object, means comparing the signal θ_A with a standard signal θ_B representative of the geometrical characteristics of a standard to determine any differential θ_Δ therebetween, and means for adjusting the frequency of the wave energy to maintain a constant wavelength of the acoustic wave energy despite changes in an environmental condition which would otherwise effect changes in said wavelength.

4,287,770

METHOD FOR THE MANUFACTURE OF ULTRASONIC TRANSDUCERS

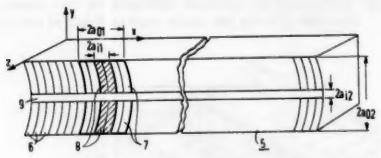
Arthur Weyns, Muizen, Belgium, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 20, 1979, Ser. No. 105,643

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855143

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—632 **18 Claims**



1. A method for the manufacture of ultrasonic transducers with at least one ultrasonic transducer whose active surface exhibits recesses and whose sound radiation field is to be prescribable in terms of focal distance, focal width and angle of aperture in connection with the focus and ultrasonic frequency, characterized by the following steps:

(a) for the two focal magnitudes of focal width (F_B) and focal distance (F_A) to be prescribed, there is first determined for one of the two focal magnitudes (for example, F_B) either its outer dimension ($2a_O$) as a function of the radius of curvature (R) of the ultrasonic transducer (**1**; **5**) or its radius of curvature (R) as a function of the outer dimension ($2a_O$);

(b) given the outer dimension determined in that manner or the radius of curvature determined in that manner, the magnitude radius of curvature or, respectively, outer dimension not yet determined for the other of the two prescribable focal magnitudes (for example, F_A) is determined.

(c) finally, the maximum value of the angle of aperture of the sound radiation field behind the focus deriving for the outer dimension ($2a_O$) and radius of curvature (R) according to steps (a) and (b) is limited by means of the introduction of a recess (**2**: **8**, **9**) in the active surface of the ultrasonic transducer (**1**; **5**) of such size ($2a_i$) that the optimum relationship between the angle of aperture and side lobes of the sound radiation field ensue.

4,287,771

VEHICLE PASS-BY AND COMMUNITY NOISE MONITOR

Richard Dugot, New York, N.Y., assignor to Instrument Development Corp., South Hackensack, N.J.

Filed Oct. 29, 1979, Ser. No. 88,762

Int. Cl.³ G01H *3/12*

U.S. Cl. 73—647 **12 Claims**

1. A sound level detection system, which comprises

(a) sound level measuring means generating an electrical output corresponding to the measured sound level,

(b) measured sound information means associated with said sound level measuring means,

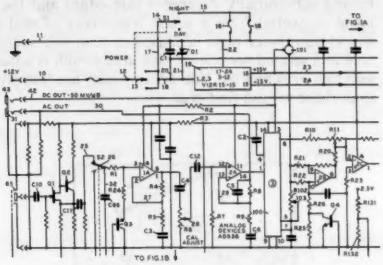
(c) circuit means interconnecting said information means and said sound level measuring means,

(d) said circuit means being operative in a plurality of conducting states, including at least a first conducting state acting to transmit said output to said information means, and a second conducting state acting to continuously, electrically store the maximum output generated by said sound level measuring means when said circuit means is operative in said second conducting state and to transmit said maximum output to said information means, and

(e) said circuit means comprising an electrical conducting means and an electrical storage means connected thereto,

(f) said electrical conducting means and said electrical storage means being operative together when said circuit means is in said second conducting state whereby said storage means continuously stores the maximum output generated by said sound level measuring means,

(g) a comparator means for comparing a predetermined



threshold value with the output of said sound level measuring means and being operative when said output exceeds said predetermined threshold value to switch said circuit means from said first conducting state to said second conducting state whereby said maximum output generated by said sound level measuring means and stored in said electrical storage means during the time said circuit means is operating in said second conducting state is continually transmitted to said sound information means.

4,287,772

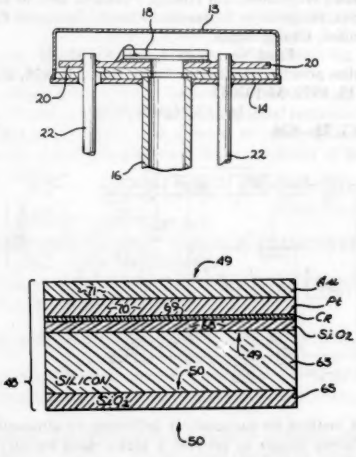
STRAIN GAGE TRANSDUCER AND PROCESS FOR FABRICATING SAME

Carlyle A. Mounteer, Irvine, and Ronald L. Poteet, San Juan Capistrano, both of Calif., assignors to Gulton Industries, Inc., Metuchen, N.J.

Division of Ser. No. 906,955, May 18, 1978, Pat. No. 4,188,258. This application Sep. 4, 1979, Ser. No. 72,064

Int. Cl.³ G01L *9/04*

U.S. Cl. 73—720 **5 Claims**



1. A strain gage transducer comprising:

a monocrystalline silicon substrate having a first and second surface;

a silicon dioxide layer disposed on said first surface of said silicon substrate;

a plurality of platinum alloy strain gage resistors formed on said silicon dioxide layer;

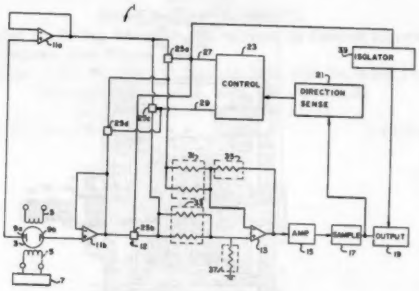
a plurality of gold leads disposed over said silicon dioxide layer interconnecting said resistors;

whereby a low cost, high performance transducer is realized.

4,287,773
BIDIRECTIONAL MAGNETIC FLOWMETER

William R. Freund, Jr., Hatfield, and John C. Grebe, Jr., Norristown, both of Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 9, 1979, Ser. No. 82,764
Int. Cl.³ G01F *1/60*
U.S. Cl. 73—861.12 **5 Claims**



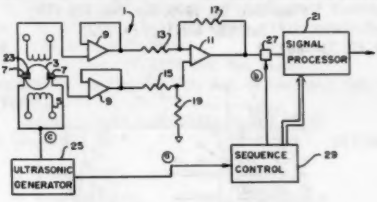
1. In a magnetic flowmeter comprising a body adapted to be connected in a flow system for measuring the flow of a fluid therethrough, means for generating a magnetic field in said fluid flowing through said body, a pair of electrodes in said body for sensing a voltage generated in said fluid, and signal processing means for producing an output signal dependent on the magnitude and polartiy of said voltage, said signal processing means comprising differential amplifier means for producing a flow-dependent signal dependent upon said voltage, said differential amplifier means including an output and a pair of inputs, each of said inputs being operatively connected to a respective one of said electrodes, and amplifier means for amplifying said flow-dependent signal, the improvement wherein said signal processing means include polarity-sensing means for sensing a change in the direction of flow through said body, and flip-flop means for reversing the connections between said electrodes and said inputs of said differential amplifier means in response to a change of said direction.

4,287,774
MAGNETIC FLOWMETER WITH ULTRASONICALLY CLEANED ELECTRODES

John C. Grebe, Jr., Norristown, and William R. Freund, Jr., Hatfield, both of Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 9, 1979, Ser. No. 82,763
Int. Cl.³ G01F *1/60*
U.S. Cl. 73—861.17 **9 Claims**

1. In a magnetic flowmeter comprising a body adapted to be connected in a flow system for measuring the flow of a fluid therethrough, means for generating a magnetic field in the fluid flowing through the body, a pair of electrodes in said body for producing a voltage dependent on the electric field generated in the fluid flowing through the magnetic field, signal processing means for converting the output voltage to an output signal, ultrasonic transducers associated with the electrodes for cleaning the faces of the electrodes when activated, and ultrasonic generator mean for periodically activating the transducers, the improvement comprising sequencing means for placing at least a part of said signal processing means in a hold state during activation of said transducers so as to

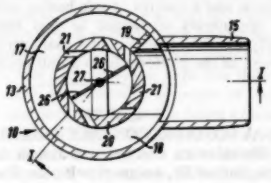


hold said output signal at an instantaneous level, thereby eliminating interference with said output signal by said ultrasonic generator.

4,287,775
FLUID FLOW MEASURING APPARATUS

Stanley P. Hutton, Southampton, England, assignor to Ferraris Development and Engineering Company Limited, London, England

Filed May 7, 1979, Ser. No. 36,902
Claims priority, application United Kingdom, May 5, 1978, 18072/78
Int. Cl.³ G01F *1/06*; A61B *5/08*
U.S. Cl. 73—861.79 **8 Claims**

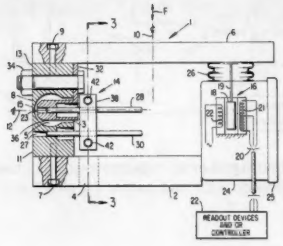


1. Respiratory flow rate measuring apparatus comprising a tubular stator which has oblique slots formed in its tubular wall; a casing within which said tubular stator is mounted and which forms a circumferential gallery around the tubular stator, a first port which communicates with the gallery at one end and which projects outwardly with respect to the stator from that end, and a second port which communicates with the interior of the tubular stator and which is in substantially coaxial alignment with the tubular stator; a rotor which is mounted for rotation within the stator; means by which a readout indication of respiratory flow rate is derived from rotation of the rotor; and a barrier which extends across the gallery so that substantially all respiratory flow which enters the gallery from said first port is constrained to flow around the tubular stator in one circumferential direction only, respiratory flow so circulated around the tubular stator being passed through to the interior of the tubular stator via the oblique slots and forming within the interior of the tubular stator a spirally swirling respiratory flow which drives the rotor, the location of the radially outer ends of the oblique slots and the orientation of the oblique slots with respect to said one circumferential direction being such that the angle by which the respiratory flow enters each slot from the gallery deviates from the respiratory flow path around the tubular stator is an acute angle.

4,287,776
FORCE TRANSDUCER

Clarence Johnson, 2922 Ash Dr., Springfield, Ohio 45504

Filed Dec. 26, 1979, Ser. No. 106,470
Int. Cl.[3] G01L 1/14, 1/26
U.S. Cl. 73—862.52 5 Claims

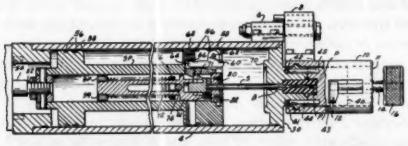


1. In a transducer for generating an output signal corresponding to the magnitude of a force having a force receiving platform cantilevered from a base through a C-shaped flexure formed with a cylindrical transverse hole and a slot opening radially into the hole to form a thin flexible middle section and opposed rigid outer sections engaging, respectively, the opposed surfaces of the base and platform, an auxilliary spring having a first section cantilevered from said rigid section engaging the surface of said force receiving platform, the longitudinal center-line of which is coincident with the transverse axis of the middle section of said C-shaped flexure, and having a second section cantilevered from the other of said rigid sections, adjustable means coupling said sections whereby the effective length of said auxiliary spring can be varied to thereby adjust the displacement of said platform about the transverse axis of said middle section produced by a given applied force, and a control couple having relatively movable elements operatively connected to said base and platform respectively generating an output signal corresponding to the displacement of the platform from a null position.

4,287,777
SEMI-AUTOMATIC CONTACT INSERTION TOOL

Bruno C. Buszkiewicz, Chicago, and Joseph A. Storcel, North Riverside, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 868,945, Jan. 12, 1978, Pat. No. 4,156,965, which is a continuation of Ser. No. 722,674, Sep. 13, 1976, abandoned. This application Feb. 6, 1979, Ser. No. 9,909
Int. Cl.[3] G05G 17/00
U.S. Cl. 74—2 5 Claims



1. An apparatus for simultaneously moving a pair of members in a first direction and for thereafter moving one of the members in a second direction opposite to the first direction, said apparatus comprising:

a fixed body;

a first piston means coupled to a first member;

a second piston means coupled to a second member;

one said piston means being slidably mounted within the other said piston means;

latching means for releasably connecting said first piston means and said second piston means together;

means for moving said first and second piston means relative to said fixed body together in said first direction;

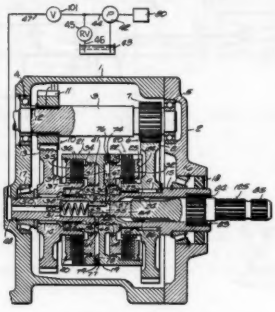
biasing means arranged for urging one of said piston means in said second direction; and

means for releasing said latching means and thereby cause said biasing means to move said one piston means in the second direction.

4,287,778
HYDRAULIC VALVE FOR TWO-SPEED POWER TAKE-OFF DRIVE

David C. Quick, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 26, 1979, Ser. No. 106,693
Int. Cl.[3] F16H 37/00
U.S. Cl. 74—15.4 12 Claims

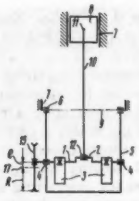


1. A two-speed power take-off drive for a tractor comprising, an input shaft, an output shaft means, a first and a second gearset for selectively driving between said input shaft and said output shaft, a first and a second hydraulic clutch and a hydraulic valve for selectively engaging one of said two first and second gearsets, a reversible stub shaft in said output shaft means operating said valve responsive to selective and alternative positioning of said reversible stub shaft for selective operation of said clutches operating said power take off drive in each of two speeds.

4,287,779
DIRECTIONAL-ACTION MECHANICAL VIBRATOR AND A MECHANICAL SYSTEM FOR CONVERTING ROTARY MOTION INTO RECIPROCATING MOTION

Evgeny S. Goncharov, ulitsa Lomonosova, 30/1, kv. 46; Anatoly N. Prilutsky, ulitsa Entuziastov, 29/2, kv. 36, both of Kiev, and Viktor I. Shevchuk, Vasilkovskogo raiona ulitsa Vokzalnaya, 23, kv. 33, poselok Glevakha Kievskoi oblasti, all of U.S.S.R.

Filed Jul. 11, 1979, Ser. No. 56,702
Int. Cl.[3] B07B 1/42; F16H 21/16
U.S. Cl. 74—26 2 Claims



1. A directional-action mechanical vibrator comprising a housing linked, through a hinge joint, to the support of the

mass being vibrated so as to balance the forces of inertia developed by said vibrator; a shaft mounted inside said housing parallel to said axis of said hinge joint; a crank provided on said shaft so as to stabilize the oscillation amplitude of said mass being vibrated; a number of inertia masses arranged on said shaft on both sides of said crank so that the centers of inertia of said masses are arranged diametrally opposite to said crank with respect to the axis of said shaft, thereby providing the balancing of the force of inertia developed by said mass being vibrated; a rod having two ends of which one end is articulated to said crank, and the other end to said mass being vibrated; the center of mass of said housing is arranged near the axis of said shaft; and the axis of said hinge joint is located close to said rod and forms an angle therewith approximately equal to $\pi/2$ radian.

4,287,780

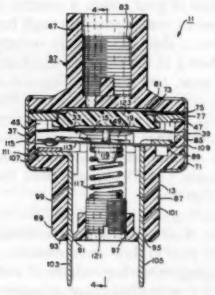
SNAP-ACTION MEMBER

Ronald W. Poling, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 960,172, Nov. 13, 1978, Pat. No. 4,200,776. This application Aug. 6, 1979, Ser. No. 63,703

Int. Cl.³ F16H *21/44;* **H01H** *35/34*

U.S. Cl. 74—100 P **2 Claims**



1. A snap-action member adapted to be disposed in a predetermined assembly position on means for seating it within a control device and engaged with a part of the control device so as to maintain the snap-action member against displacement movement generally about the seating means from the predetermined assembled position of the snap-action member thereon, the snap-action member comprising:

a body formed from a metallic material having a grain orientation extending thereacross in a predetermined direction;

a peripheral portion on said body defining a generally constant diameter of said body at least about a major portion thereof and adapted to be seated on the seating means in the control device;

a pair of spaced apart surfaces on said body interconnected with said peripheral portion and arcuately displaced in a direction generally perpendicular to a plane intersecting with said peripheral portion, respectively; and

at least one projection on said body between said peripheral portion and said surface pair and predeterminately arranged so as to extend generally in the predetermined direction of the grain orientation in said metallic material of said body, said at least one projection being adapted to engage the control device part so as to locate the snap-action member in its preselected assembly position generally against the displacement movement about the seating means in the control device and thereby align the predetermined direction of the grain orientation in the metallic material of said body with respect to at least the seating means when said snap-action member is disposed thereon in the predetermined assembled position.

4,287,781

TRANSMISSION WITH DOUBLE FRICTION CLUTCH

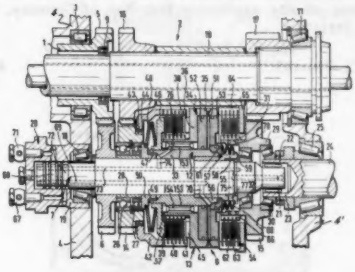
Walter Zenker, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Sep. 17, 1979, Ser. No. 76,087

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841053

Int. Cl.³ F16H *3/08;* **F16D** *25/062, 25/10*

U.S. Cl. 74—375 **10 Claims**



1. A gear change transmission, especially for agricultural vehicles and construction-industry vehicles, having two gear-shifting groups each being actuatable under load by a friction clutching arrangement comprising:

a first clutch inherently urged to engagement by means of a resilient biasing member and adapted to be disengaged by means of at least one piston-cylinder unit having at least one piston; and

a second clutch adapted to be engaged by means of at least one piston-cylinder unit, having at least one piston, said at least one piston of said second clutch having an effective operating surface area which is less than the effective operating surface area of said at least one piston of said first clutch, with the pertaining cylinders of each of said first clutch and said second clutch being connectible in such a way that said at least one piston of said first clutch and said at least one piston of said second clutch are subjected to the same control pressure in each clutch position, said first clutch and said second clutch forming a double friction clutch, and said at least one piston of said first clutch and said at least one piston of said second clutch being operable in a common cylinder chamber member, said double-row clutch comprising a primary part, said primary part including:

a hub part;

a radial member projecting radially from said hub part between said first clutch and said second clutch;

a cylindrical portion projecting axially from said radial member on that side thereof which faces said second clutch, said cylindrical portion being spaced from said hub and concentric thereto, said cylindrical member and said radial member forming a cup-shaped member with the annular space between said hub and said cylindrical portion forming said cylinder chamber for said at least one piston of said first clutch and said at least one piston of said second clutch;

said first clutch including secondary clutch lamellae, and primary clutch lamellae, and said second clutch including primary lamellae and secondary lamellae;

a first contact profile, on said hub radially inwardly of said lamellae of said first clutch on that side of said radial member which faces said first clutch, for engaging said primary lamellae of said first clutch; and

a second contact profile on said cylindrical portion radially outwardly of said lamellae of said second clutch on that

side of said radial member which faces said second clutch, for engaging said primary lamellae of said second clutch.

4,287,782

ELECTRIC REGULATING DEVICE

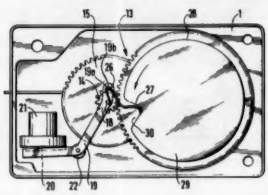
Gerhard Ruschek, Hattersheim, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 860,678, Dec. 15, 1977, Pat. No. 4,187,734. This application Oct. 27, 1978, Ser. No. 955,458

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1977, 2741475

Int. Cl.[3] **B60K** *31/00;* **F16H** *57/00*

U.S. Cl. 74—405 **6 Claims**



1. An electric regulating device, particularly for a speed control device for motor vehicles, comprising

a regulating member,

means for actuating said regulating member, said means constituting a rotatably mounted element,

a servomotor,

a coupleable mechanical gearing means and a coupling means therefor including an electromagnet for operatively connecting said element with said servomotor,

an armature cooperating with said electromagnet, and

said gearing means includes a plurality of gears, at least one of said gears of said gearing means being substantially radially moveably mounted and being operatively connected with said armature,

said gearing means including a gearwheel operatively coordinated to said at least one gear,

spring means for biasing said armature by a spring force for moving said one gear out of engagement with said gearwheel when said electromagnet is without current,

means for reducing pretension of said spring means in a neutral position of the regulating device,

said pretension reducing means includes a cam wheel operatively coupled to said element,

said spring means comprises a compression spring having one end in connection with said armature and having another end supported on said cam wheel,

a housing,

said at least one gear constitutes another gearwheel having a shaft,

said shaft is articulated on one end thereof on said housing,

an arm disposed on said armature, and

the other end of said shaft is disposed on said arm,

said one end of said shaft is formed semi-spherically,

said housing is formed with a spherical indentation, said one end of said shaft is mounted in said spherical indentation,

said other end of said shaft is formed into a pin-shaped set-off,

said arm is formed with an opening,

said pin-shaped set-off is inserted through said opening in said arm,

said one end of said compression spring is mounted on said arm against said pin-shaped set-off,

said arm includes a free end adjacent said opening,

a pin is secured to said free end of said arm, and

said spring means includes a substantially U-shaped central portion engaged around said pin.

4,287,783

MECHANISM FOR LUBRICATING BEARINGS OF A COUNTER SHIFT GEAR FOR A GEAR TRANSMISSION

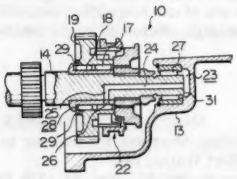
Shiuichiro Ida; Shoichi Ohshima; Syunichi Hirashima, all of Toyota, and Harada Yukihiro, Kariya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 28, 1979, Ser. No. 108,229

Claims priority, application Japan, Oct. 22, 1979, 54-144863[U]

Int. Cl.[3] **F16N** *7/36;* **F01M** *9/06*

U.S. Cl. 74—467 **3 Claims**



1. In a gear transmission including a casing containing lubrication oil, a counter shaft rotatably mounted in said casing and constantly transmitting rotational movement from a power input shaft by means of gear trains, a counter shift gear rotatably mounted on said counter shaft through bearings disposed in an annular space, a shift gear rigidly mounted on a power output shaft and being in constant meshing engagement with said counter shift gear, and clutch means for interrupting the relative rotational movement between said counter shaft and said counter shift gear, the improvement comprising:

an annular counter inner race disposed between said bearings and said counter shaft and interfacing with and removably secured to said counter shaft for rotation with said counter shaft; and

means for lubricating said bearings and the adjacent surfaces of said counter shaft and said counter inner race comprising an axial oil port in fluid communication with the interior of said casing extending axially of said counter shaft, a first radial oil port in fluid communication with said axial port and with the interface between the adjacent surfaces of said counter shaft and said counter inner race, and a second radial oil port in said counter inner race in fluid communication with said first radial oil port and the annular space in which said bearings are disposed.

4,287,784

APPARATUS FOR FACILITATING GEAR CHANGING IN MECHANICAL GEARBOXES

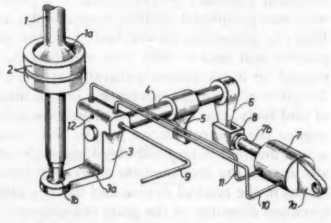
Bengt E. Cedendahl, Södertälje, Sweden, assignor to Saab-Scania Aktiebolag, Södertälje, Sweden

Filed Jul. 2, 1979, Ser. No. 53,849

Claims priority, application Sweden, Jul. 10, 1978, 7807669

Int. Cl.[3] **G05G** *9/18;* **F15B** *9/10*

U.S. Cl. 74—473 R **12 Claims**



1. An apparatus for facilitating gear changing in mechanical gearboxes comprising a gear selector housing in which a gear

selector shaft is rotatably and axially displaceably mounted, at least one lever being secured to the gear selector shaft by means of a torque transmitting connection, said gear selector shaft being displaced axially during a selecting step to a preselected engagement position and during an engaging or disengaging step is caused to turn for engaging or disengaging the appropriate gear, characterized in that the torque transmitting connection between the gear selector shaft and the lever is formed with a limited play in both directions of rotation, said play allowing relative free movement in the direction of rotation during the initial phase of an engaging or disengaging movement during which a control valve arranged in the gear changing mechanism is activated and triggers the actuation of a pressure-operated servo cylinder which, with anchorage in a fixed bracket and with connection to a lever on the gear selector shaft, is arranged to execute the gear changing work to a major extent.

4,287,785

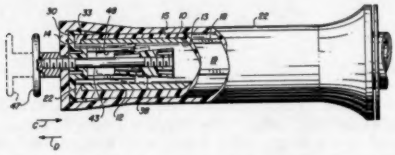
THROTTLE SETTING DEVICE

Robert T. Hunt, 549 E. McKellips, Space 86, Mesa, Ariz. 85203

Filed Dec. 12, 1979, Ser. No. 102,891

Int. Cl.³ G05G *1/08, 5/16*

U.S. Cl. 74—488 **7 Claims**



1. A throttle setting device for use in combination with a vehicle, which vehicle includes,

a cylindrical tubular handle bar having an inside surface and an end,

a tubular throttle sleeve having an outside surface coaxially rotatably mounted upon said handle bar, and

a hand grip coaxially sheathing said throttle sleeve and rotatable therewith,

and for retaining said throttle sleeve at rotatably selective positions relative said handle bar, said throttle control device comprising:

a. an end member positioned proximate the end of said handle bar;

b. engagement means carried by said end member for interlocking said end member with said throttle sleeve; and

c. retention means carried by said end member for selectively engaging said handle bar and stabilizing said end member against rotation.

4,287,786

STEERING COLUMN JACKET ON THE STEERING COLUMN OF MOTOR VEHICLES

Werner Berginski, Werdohl-Eveking, Fed. Rep. of Germany, assignor to Firma Leopold Kostal, Lüdenscheid, Fed. Rep. of Germany

Filed Nov. 26, 1979, Ser. No. 97,156

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1979, 2905130

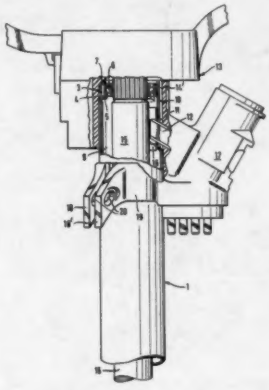
Int. Cl.³ B62D *1/16*

U.S. Cl. 74—492 **2 Claims**

1. In a steering column assembly having a steering spindle and a jacket therearound with a steering column switch having a steering column lock pin for cooperation with the steering spindle, the improvement comprising:

at least three coplanar tabs struck inwardly from adjacent one end of said jacket and engaging one end face of a bearing for said steering spindle, said tabs being substantially equally angularly displaced from each other around said jacket;

said one end of said jacket being bent inwardly to engage the other end face of said bearing at at least two opposed positions and thereby hold said bearing in fixed axial position in said jacket; and



an inwardly struck longitudinal rib on said jacket having an opening therein of a width at least equal to the width of said lock pin, said lock pin being projectable through said opening into engagement with said steering spindle.

4,287,787

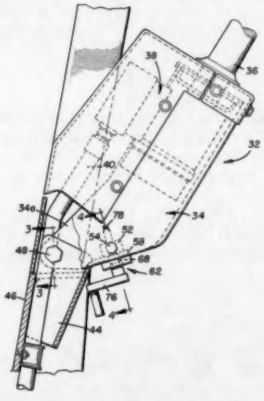
APPARATUS FOR MOVING A MEMBER

James A. Kulhanek, Perry, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Nov. 9, 1979, Ser. No. 92,808

Int. Cl.³ B62D *1/18;* **F16H** *25/20*

U.S. Cl. 74—493 **5 Claims**



1. An assembly (32) for adjusting a steering wheel (30) in relation to an operative position of the wheel (30), the wheel (30) being supported on a steering column (36), comprising:

(a) movable means (34, 52, 54) for supporting the steering column (36);

(b) fixed means (44, 48, 58) for pivotally supporting said movable means (34, 52, 54), said fixed means (44, 48, 58) including a seat (58), said movable means (34, 52, 54) being on said seat (58) in the operative position of the wheel (30); and

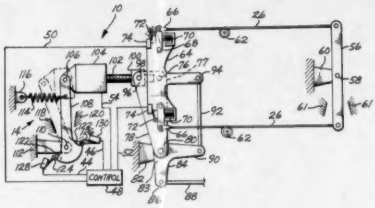
(c) means (62) for actuating said movable means (34, 52, 54) to move off said seat (58) and pivot about said fixed means (44, 48, 58).

4,287,788

SELF-RIGGING CABLE CONTROL SYSTEM AND PROCESS

Russell E. Baetke, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 14, 1979, Ser. No. 38,996
Int. Cl.[3] F16C 1/10
U.S. Cl. 74—501.5 R 8 Claims



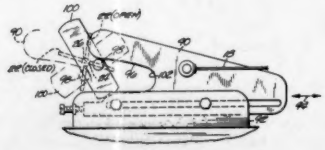
1. A control cable tension regulation system adapted to regulate tension in an opposed cable control system of an aircraft, said tension regulation system comprising load cell means for creating a predetermined tension load in a control cable system capable of transmitting a control signal thereover; first sensing means for monitoring said predetermined tension load; first signal means responsive to said first sensing means for producing one signal if the sensed load is greater than said predetermined load and a different signal if the sensed load is less than said predetermined load, power means responsive to said first signal means for restoring said predetermined tension load and an actuator connected to said power means; at least two, movably mounted control cable attachment means arranged in opposed pairs and connected to said actuator; second sensing means for monitoring each cable attachment means and second signal means responsive to each of said second sensing means for producing a signal that will prevent actuation of said power means if said attachment means moves beyond a predetermined position.

4,287,789

ENGINE THROTTLE CONTROL FOR MARINE PROPULSION DEVICES AND THE LIKE

Alan R. Dudleston, Waukegan, Ill., and Harry Stemper, Milwaukee, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 939,778, Sep. 5, 1978, Pat. No. 4,237,747.
This application Aug. 8, 1980, Ser. No. 176,274
Int. Cl.[3] G05G 7/02; F16K 31/524, 31/528
U.S. Cl. 74—516 1 Claim



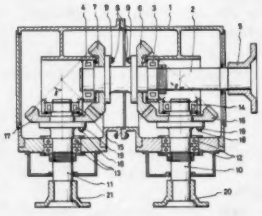
1. A throttle control comprising a control lever mounted for movement between an idle position and a full throttle position, a throttle lever adapted to actuate an engine throttle in response to rotational movement of said throttle lever, a cam plate connected to said control lever and mounted for translatory movement between an idle position and a full throttle position and relative to the rotational axis of said throttle lever in response to movement of said control lever between the control lever idle and full throttle positions, said cam plate having an inclined cam surface including a terminal portion, and means connecting said cam plate to said throttle lever for rotating said throttle lever in response to movement of said cam plate and for effecting gradually increasing rotational movement of said throttle lever relative to incremental movement of said cam plate during at least a portion of control lever movement from the control lever idle position toward the control lever full throttle position, said connecting means including a follower mounted on said throttle lever in spaced relationship to the throttle lever axis and engageable by said cam surface, said follower being engaged by said cam surface terminal portion after movement of said cam plate to a position intermediate the cam plate idle and full throttle positions and so as to effect throttle controlling movement of said follower during movement of said cam plate from the cam plate intermediate position to the cam plate full throttle position.

4,287,790

HIGH-SPEED BEVEL GEAR TRANSMISSION SYSTEM

Minoru Fujiwara; Tominori Yamada, and Tstsuji Tamura, all of Tamano, Japan, assignors to Mitsui Engineering and Shipbuilding Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1979, Ser. No. 94,877
Claims priority, application Japan, Oct. 11, 1979, 54-131143
Int. Cl.[3] F16H 37/06, 1/22
U.S. Cl. 74—665 GB 7 Claims



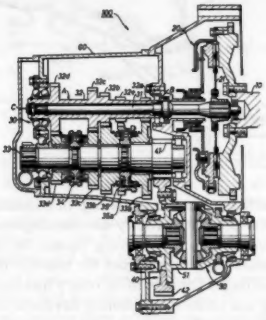
1. A high-speed bevel gear transmission system for transmitting a power between input and output shafts the axes of which intersect each other, which comprises an input shaft mounted on axially slidable bearings; a pair of driving bevel gears which are fixedly mounted on said input shaft such that said bevel gears face in opposite directions, teeth of the bevel gears being the same in number and size and spirally arranged in the opposite directions to each other; a pair of driven bevel gears engaged with said driving bevel gears, respectively; a pair of output shafts on which said driven bevel gears are fixedly mounted, respectively; and angular contact ball bearings for supporting said output shafts, the speed transmission ratio of the output shafts to the input shaft being between 1.45:1 to 0.476:1, the ratio R of a thrust load in the axial direction of said driven gears to a tangential load of said driven gears from a pressure angle α and a helix angle β of said driving bevel gears and said driven bevel gears, and a pitch cone angle δ of said driven bevel gears being defined by the formula, $R=[(\tan\alpha\cdot\sin\delta)/\cos\beta]-\tan\beta\cdot\cos\delta$ being from -0.324 to 0.1.

4,287,791

POWER TRANSMISSION UNIT FOR AUTOMOTIVE VEHICLES

Akio Numazawa, Nagoya, and Hajime Arai, Aichi, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 9, 1979, Ser. No. 55,783
Claims priority, application Japan, Jul. 11, 1978, 53/84955
Int. Cl.³ F16H *37/08, 3/08;* **F16D** *3/10*
U.S. Cl. 74—701 **2 Claims**



1. In a power transmission unit for an automotive vehicle including a change-speed mechanism, a final drive gearing and a differential gear unit housed within a casing, said change-speed mechanism being drivingly connected to an engine by a friction clutch assembly, and said final drive gearing being connected to an output shaft of said change-speed mechanism to drive said differential gear unit,

the improvement wherein said change-speed mechanism comprises a first input shaft comprising a torsion bar drivingly connected at the inner end thereof to an output member of said clutch assembly and integrally formed at an intermediate portion thereof with an enlarged portion; a second hollow input shaft in surrounding relationship to said first input shaft and having an inner end facing the enlarged portion of said first input shaft and an outer end axially slidably connected to the outer end of said first input shaft, said second input shaft having a plurality of drive gear wheels for selectively driving respective change-speed gear wheels on said output shaft; resilient means interposed between the outer ends of said first and second input shafts to bias the enlarged portion of said first input shaft toward the inner end of said second input shaft; and an annular friction member secured to the enlarged portion of said first input shaft and maintained in engagement with the inner end face of said second input shaft.

4,287,792

VARIABLE GEAR RATIO TRANSMISSION

Alvin Dailey, 4527 New Hampshire Ave., NW, Washington, D.C. 20011

Continuation-in-part of Ser. No. 874,243, Feb. 1, 1978, Pat. No. 4,192,203. This application Jan. 4, 1980, Ser. No. 109,464
Int. Cl.³ B60K *41/14;* **F16H** *3/44, 57/10*
U.S. Cl. 74—863 **14 Claims**

1. A constant meshed, variable gear ratio transmission comprising:

a gear box including:

a housing,

input and output shafts journaled in said housing;

a plurality of planetary gear sets in said housing coupling said shafts together and including,

a pinion gear on each of said shafts;

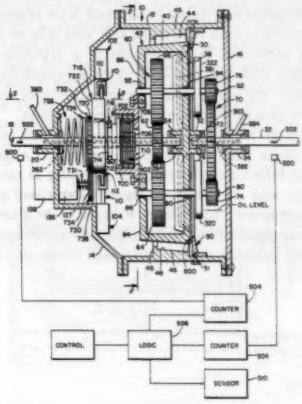
a plurality of planetary gears meshing with each said pinion gear;

planetary gear shafts connecting the corresponding planetary gears of each pinion;

a cage rotatably supported in said housing and supporting said planetary gear shafts;

means for controlling the rotation of said cage, including:

first hydraulic circuit means;



clutch means operatively associated with said first hydraulic circuit means and said cage for selectably engaging said first hydraulic circuit means to selectably control the rotation of said cage; and

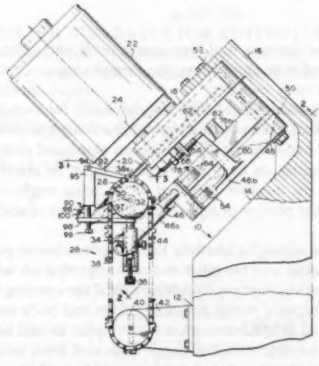
second independent hydraulic circuit means for controlling the rotation of said planetary gear shafts.

4,287,793

UNIVERSAL SAW CHAIN GRINDING MACHINE

E. Ray Silvey, 1231 Dutton Rd., Eagle Point, Oreg. 97524

Continuation of Ser. No. 535,661, Dec. 23, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,473
Int. Cl.³ B23D *63/16*
U.S. Cl. 76—25 A **16 Claims**



1. A saw chain grinding machine comprising:

a machine base,

a disc-shaped rotatable grinding wheel,

said base including means mounting said grinding wheel for rotation about a central axis perpendicular to the plane of said wheel and lying in a median plane dividing said wheel into right-hand and left-hand grinding segments,

saw chain holder means for supporting a saw chain with the cutter elements in position for grinding,

a support arm for supporting said holder means,

said support arm extending lengthwise in its operative position across at least a portion of said wheel on one side thereof

means mounting said support arm at a position spaced along said arm from said holder means on said base for swinging movement about a pivot axis parallel to said axis of rotation, said pivot axis being positioned with respect to said axis of rotation such that when said arm is in an operative position with said holder means in a grinding position offset from said median plane along a peripheral edge of said wheel said arm extends from said holder means in a direction generally toward said median plane,

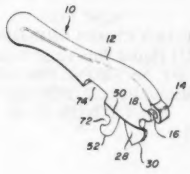
said pivot axis being positioned in said median plane, said median plane passing through a peripheral edge of said wheel to define a center point of grinding at said peripheral edge, said arm being swingable about said pivot axis to position a saw chain cutter element to be sharpened at said center point and at variable angular grinding positions along said peripheral edge from said center point.

4,287,794

CONTAINER OPENING TOOL

John S. Kubach, and Elizabeth V. Kubach, both of 1406 Milan Rd., Sandusky, Ohio 44870

Filed May 23, 1980, Ser. No. 152,609
Int. Cl.³ B67B *7/40*
U.S. Cl. 81—3.31 **15 Claims**



1. A container opening tool for a container having a frangible closure panel with an opening tab, comprising:

an elongated body member;

hook means at one end of said body member for engaging the lifting end of the opening tab of the frangible closure panel, said hook means comprising an elongated element folded inwardly on itself and terminating in an inwardly projecting tip member disposed at an acute angle with respect to the portion of said element at the base of said tip member;

first abutment means for abutting the frangible closure panel of the container and the inner end of the opening tab when said hook means engages the lifting end of the opening tab, said first abutment means projecting from said body member and fixed in spaced relation with respect to said hook means at a predetermined distance from said hook means;

second abutment means for abutting the surface of the container in opening a container having a tear-away closure panel and for thereby moving said first abutment means away from the container, said second abutment means being spaced rearwardly from said first abutment means; and,

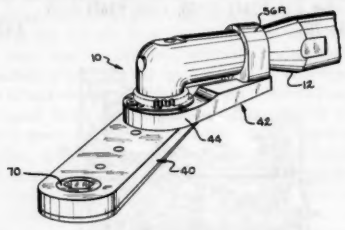
means for receiving the lip of the container adjacent the container opening in opening a container having an inwardly pivoting closure panel.

4,287,795

ADJUSTABLE BLADE WRENCH

George R. Curtiss, Chardon, Ohio, assignor to The Rotor Tool Company, Cleveland, Ohio

Filed Nov. 9, 1979, Ser. No. 92,999
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.26 **4 Claims**



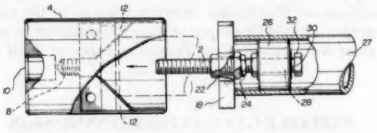
1. A wrench apparatus comprising, in combination, a housing, means for providing rotary motion disposed within said housing, a blade structure having means for engaging and rotating a fastening device, means for transferring rotary motion from said means for providing rotary motion to said means for engaging and rotating a fastening device, a coupling member disposed generally between said housing and said blade structure, said coupling member having clamp means engaging said housing for removably securing said member to said housing, said coupling member and said blade structure including mating means for providing adjustment of the angular relationship between said blade structure and said coupling member over a full circle and locking means for maintaining such angular relationship.

4,287,796

TOOL FOR PREPARING TUBE ENDS FOR WELDING

William D. Palmer, 195 Brier Hill Rd., London, Ontario, Canada N5Y 4V8

Filed Feb. 6, 1980, Ser. No. 119,100
Claims priority, application Canada, Jun. 26, 1979, 330609
Int. Cl.³ B23B *3/22, 51/00*
U.S. Cl. 82—4 C **17 Claims**



1. A tool for preparing a tube or pipe end for welding comprising:

a central shaft;

chamfering blade support means affixed to and coaxial with the central shaft and including a recess for receiving drive means, at least one support web and a chamfering blade affixed to each at least one said web;

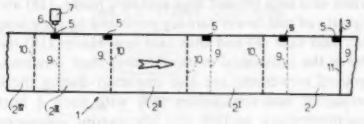
squaring blade support means coaxial with said shaft and positionable longitudinally along said shaft independently of the position of said chamfering blade support means, and rotatable with said chamfering blade support means, and having affixed thereto at least one squaring blade;

and alignment means for aligning said shaft with said tube or pipe end.

4,287,797
DEVICE FOR FEEDING AND ADJUSTING A CONTINUOUS WEB AND FOR CUTTING IT INTO PORTIONS

Enzo Seragnoli, Bologna, Italy, assignor to G.D. Societa per Azioni, Bologna, Italy

Filed Dec. 13, 1979, Ser. No. 103,281
Claims priority, application Italy, Dec. 22, 1978, 3634 A/78
Int. Cl.³ B26D *5/34*; G05B *19/29*
U.S. Cl. 83—74 **8 Claims**



1. A device for feeding and adjusting a continuous web and for cutting it into portions, said portions to be cut in a predetermined zone on said web, said device comprising means for periodically cutting in accordance with operational cycles which correspond to the formation of a portion of said web, means for feeding said web to said cutting means, and means for detecting at least one reference mark for said zone on said web, comprising first means for checking the position of said predetermined cutting zone relative to a cutting zone consequent on the action of said cutting means and to quantify any diversity between said two zones, and second means for controlling and correcting said any diversity relative to each portion cutting operation, arranged to directly or indirectly receive signals from said first means as a function of said any diversity, and to act on at least one of said feed means and said cutting means in order to eliminate said any diversity relative to each portion cutting operation, and wherein said first means comprise logic circuits and a binary code increasing counter and receive at least one first signal indicative of said cutting zone consequent on the operation of said cutting means, and one second signal indicative of said predetermined cutting zone, and are arranged to supply from said counter and from said circuits a third and fourth signal which indicate said any diversity between said two zones in terms of its absolute value relative to a predetermined quantification unit and in terms of its sign respectively, said predetermined quantification unit being a function of a pulse signal which reaches said first means, and of which the frequency is a function of the duration of the operating cycle of at least one of said periodic cutting means and said feed means for said web; and wherein said second control and correction means comprise a binary code decreasing counter and logic circuits which receive at least said third and said fourth signal, or a pair of signals homogeneous with said third and fourth signal, and said pulse signal.

4,287,798
SAWMILL WORK FEEDING AND PRODUCT HANDLING APPARATUS

Hill M. Cooper, Jr.; William B. Cooper, and Robert M. Cooper, all of P.O. Box 586, Wadley, Ga. 30477

Filed Jan. 31, 1980, Ser. No. 117,098
Int. Cl.³ B27B *7/00*
U.S. Cl. 83—155 **19 Claims**

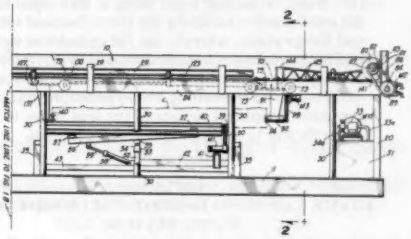
1. A sawmill of the type having a frame with a saw means for cutting slabs and boards from a log as it is reciprocated along a linear path, the log being suspended by dogs, wherein the improvement comprises:

(a) a pair of opposed parallel main rails disposed in a common horizontal plane and carried by said frame;

(b) a central monorail disposed parallel to and carried by said frame above and between said main rails;

(c) a main carriage having a main plate and wheels mounted for rotation on said plate, said wheels riding on said rails for supporting said main carriage for reciprocal movement longitudinally along said frame and for preventing appreciable pivoting or tilting of said plate;

(d) an auxiliary carriage having an auxiliary plate and a pair of wheels rotatably mounted for rotation on said plate and riding respectively on said rails for supporting an end portion of said auxiliary plate for movement longitudinally along said frame, said auxiliary carriage being rearwardly of said main carriage in said frame; said auxiliary carriage also having roller means supported by and riding on said monorail and spaced in a longitudinal direction from said pair of wheels for supporting another portion of said auxiliary plate; said wheels and said roller means preventing appreciable pivoting or tilting of said auxiliary plate;



(e) a pair of struts extending downwardly respectively from said main plate and said auxiliary plate for respectively supporting said dogs;

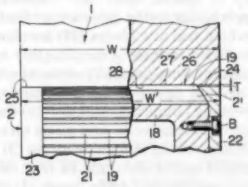
(f) control means connected between said main carriage and said auxiliary carriage for progressively altering the position of such carriages with respect to each other for moving said dogs into and out of clamping positions with respect to the ends of a log position between said dogs; and

(g) drive means for driving one of the carriages with respect to said frame whereby said dogs move said log in a linear path past said saw means for cutting action of said saw means.

4,287,799
ROLLER APPARATUS FOR CUTTING GLASS FIBERS

Toshihito Fujita; Toshiaki Kikuchi, and Koji Nakazawa, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Jul. 18, 1977, Ser. No. 816,766
Claims priority, application Japan, Jul. 20, 1976, 51-86356
Int. Cl.³ D01G *1/04*
U.S. Cl. 83—347 **2 Claims**



1. In a cutting roller for directly chopping wet continuous elongated filaments which are drawn from a bushing into finite fibers of predetermined length including a driven cutting roller drum mounting a plurality of spaced, pa[illegible]el, radially outwardly extending cutting blades and adapted to be biased into driving and filament cutting engagement with the resilient

outer peripheral surface of a filament feed roller, the improvements characterized by:

(a) said cutting rollerdrum comprising a main body having axial slots in the surface thereof for receiving cutting blades and retainer strips, and cylindrical flange plates removably attached to the opposite ends of said main body, each said flange plate having a diameter greater than that of said main body and a flat cylindrical surface, the inner surface of said flange plate inclined inwardly at the part extending radially past the circumference of said main body,

(b) a plurality of retainer strips associated with said cutting blades, respectively, said retainer strips and cutting blades being held in said axial slots by said inwardly inclined surfaces of said flange plates, and

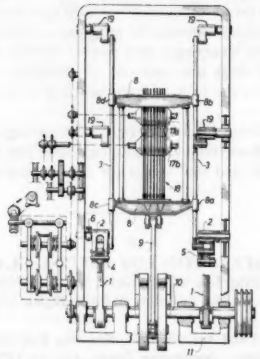
(c) the width of the feed roller being at least equal to that of the cutting roller including the flat cylindrical surfaces of said flange plates, whereby the flat cylindrical surfaces of said flange plates frictionally contact and drivingly engage the opposite ends of the outer peripheral surface of the feed roller, and the cutting blades penetrate into the resilient outer peripheral surface of the feed roller to a depth just sufficient to implement filament chopping.

4,287,800

FRAME SAW WITH HORIZONTALLY MOVABLE GUIDE SYSTEM

Gustaf A. Persson, Per Hallströms väg 2, S-131 00 Nacka, Sweden

Filed Aug. 22, 1979, Ser. No. 68,510
Claims priority, application Sweden, Aug. 24, 1978, 7808956
Int. Cl.³ B23D *49/04;* B26D *1/06*
U.S. Cl. 83—425.3 **13 Claims**



1. In a frame saw of essentially horizontally fed timber comprising a plurality of spaced apart saw blades (**18**) located substantially perpendicular to the direction of feed of the timber; a sash (**8**) in which said saw blades (**18**) are clamped; guide means (**3**) on which said sash (**8**) is reciprocably mounted for movement in a reciprocating generally upward and generally downward motion with upper and lower turning points; a crankshaft (**10**) pivotally coupled to said sash (**8**) for reciprocably moving said sash (**8**) relative to said guide means (**3**); connecting means (**12**) for moving said guide means (**3**) by a predetermined displacement in the direction of feed of the timber before the sash (**8**) is moved; said guide means (**3**) and connecting means (**1, 2**) each defining respective pivot points or fulcrums in or in relation to said connecting means (**1, 2**);

the improvement wherein:

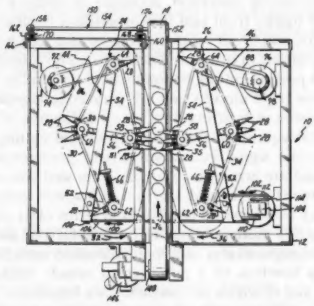
said pivot points or fulcrums of said guide means (**3**) are located in relation to said pivot points or fulcrums of said connecting means (**1, 2**) such that said fulcrums of said guide means (**3**) move along a circular arc with a shorter radius than do said fulcrums of said connecting means (**1, 2**) to create a phase displacement between the movement of said guide means relative to the movement of said saw blades, so as to impart to said guide means (**3**) and thus to said sash (**8**) carrying said saw blades (**18**) a movement with such a horizontal component as to cause said guide means (**3**) to be displaced against the essentially horizontal feed direction of the timber when said sash (**8**) and thus said saw blades (**18**) are in the vicinity of said upper turning point and during a downward movement, and in such a complementary movement with a horizontal component in the essentially horizontal feed direction of the timber when said sash (**8**) and thus said saw blades (**18**) are in the vicinity of said lower turning point and on their way up so that said sash (**8**) and thus said saw blades (**18**) over and above the horizontal motion during their downward and upward movement are also imparted during the cutting period of said saw blades (**18**) with such a horizontal complementary motion that the cutting engagement of said saw blades (**18**) with the timber becomes substantially constant (FIG. **6**) during the greater part of the cutting period.

4,287,801

DEVICE FOR PERFORATING BAKERY GOODS SUCH AS ENGLISH MUFFINS

Douglas R. Hanson, 1720 - 9th Ave. South, Anoka, Minn. 55303

Filed Feb. 4, 1980, Ser. No. 118,509
Int. Cl.³ B26D *3/30*
U.S. Cl. 83—871 **10 Claims**



1. A device for perforating the edges of individual bakery products to facilitate the separation of the products into portions comprising:

a rigid frame;

conveyor means mounted on said frame and adapted to move products in sequence along a path of movement in a first direction;

at least one set of perforating blades, said blades having outer ends;

means to mount said set of blades for sequential movement of the blades in a blade path having a portion adjacent to and parallel to the conveyor means, said blades in said path portion moving in said first direction;

said means mounting said blades guiding said blades from a first position to a second position in direction transverse to the first direction whereby the outer ends of the blades move toward and engage products on the conveyor means as the products and blades move in said first direction and the blades are in said path portion;

means to provide reactive force on products on the conveyor means as the blades engage the products sufficient so the blades pierce the products as the blades move from said first to said second position along said path portion; and

means to oscillate said at least one set of perforating blades

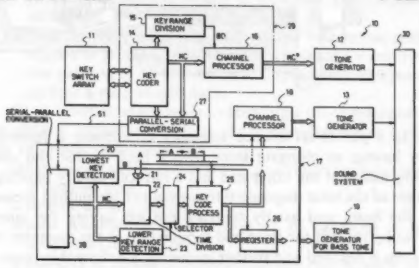
in direction transverse to said first direction as said blades move from said first to said second position.

4,287,802

ELECTRONIC MUSICAL INSTRUMENT OF TIME DIVISION MULTIPLEXED TYPE

Akio Imamura, and Naota Katada, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 17, 1979, Ser. No. 40,041
Claims priority, application Japan, May 19, 1978, 53-60405
Int. Cl.³ G10H *1/22, 5/00*
U.S. Cl. 84—1.01 **9 Claims**



1. An electronic musical instrument comprising:

key switches corresponding to keys;

depressed key detection means for detecting on-off states if said key switches to sequentially deliver key data of depressed keys in respective time slots of a scanning cycle in which keys are scanned in the order of corresponding note pitch;

specific key detection means for detecting the specific time slot in which key data of the note of the first key in a predetermined priority order among the depressed keys is delivered;

a processing circuit for using one half of the specific time slot detected by said specific key detection means as a first processing time and the other half of said specific time slot detected by said specific key detection means as a second processing time, and for applying different processing to the key data of said first key respectively during said first and second processing times;

a first musical tone generation circuit for generating musical tones in response to the key data supplied during said first processing time; and

a second musical tone generation circuit for generating musical tones in response to the key data supplied during said second processing time.

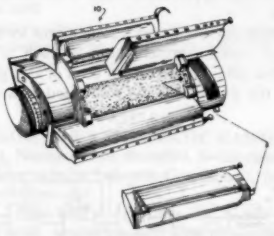
4,287,803

ELECTRIC MOUTH ORGAN HOLDER

Fred Zema, 26 Rosehill Ave., Tarrytown, N.Y. 10591

Filed Jun. 28, 1979, Ser. No. 53,069
Int. Cl.³ G10H *1/04, 3/12*
U.S. Cl. 84—1.06 **18 Claims**

1. An electric mouth organ holder comprising a first member having means thereon for holding a plurality of harmonicas; a second member held in movable relation to said first member; means on said holder for holding a single microphone; and said microphone, wherein said second member collects sound emitted from said harmonicas individually and wherein any individual harmonica, when held by said first member may be selectively and exclusively positioned and positively engaged acoustically adjacent said second member, with said second member being interposed between said selected harmonica and said microphone to direct sound from said selected harmonica to said microphone, said holder further containing means for manually altering sound emitted from said selected harmonica in the acoustic path between said selected harmonica and said



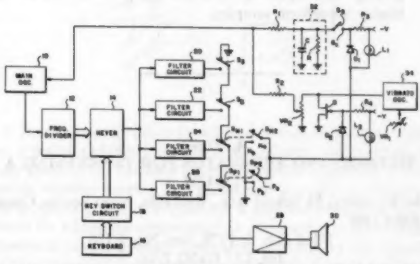
microphone whereby said emitted sound is altered prior to pickup thereof by said microphone.

4,287,804

ELECTRONIC MUSICAL INSTRUMENT WITH TIMBRE SELECTION

Yasunori Hirose, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 9, 1980, Ser. No. 167,121
Int. Cl.³ G10H *1/02, 1/06*
U.S. Cl. 84—1.19 **9 Claims**



1. An electronic musical instrument capable of selecting a timbre applied to a sound produced therefrom comprising:

(a) keyboard means;

(b) means for selecting a desired timbre from among a plurality of timbres;

(c) means for electronically producing the sound with the selected timbre by said selecting means in response to a keyboard means;

(d) means for selectively imparting a plurality of effects to said sound;

(e) means for generating a timbre signal in accordance with said selected timbre; and

(f) means for preventing a specific effect or effects among said plurality of effects imparted to said sound in response to said timbre signal from said generating means.

4,287,805

DIGITAL ENVELOPE MODULATOR FOR DIGITAL WAVEFORM

Glenn Gross, Chicago, Ill., assignor to Norlin Industries, Inc., Deerfield, Ill.

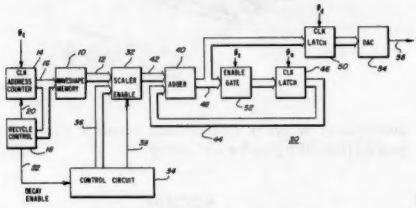
Filed Apr. 28, 1980, Ser. No. 144,287
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.26 **39 Claims**

1. In an electronic musical instrument of the type having means developing a plurality of series of successive binary waveform samples representing a musical waveform signal,

apparatus for imposing an envelope on said plurality of series of waveform samples comprising:

scaling means operable for developing a plurality of different scaled representations of each of said binary waveform samples;

control means operating said scaling means for developing a group of scaled representations of each of said binary waveform samples, the sum of each of said groups representing the product of the associated binary waveform



sample and a multiplication factor, said multiplication factor changing by a predetermined amount during each of said series of binary waveform samples with the predetermined amounts characterizing consecutive ones of said series differing by a multiple of two; and

output means responsive to said scaling means for successively summing the scaled representations forming each of said groups for developing an output staircase signal comprising an amplitude modulated representation of said binary waveform samples.

4,287,806

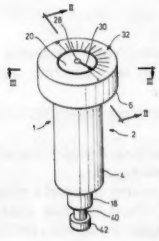
METHOD AND APPARATUS FOR TENSIONING A DRUM

John R. Neary, 54 School Ave., Kentville, Nova Scotia, Canada B4M 2P9

Filed Feb. 6, 1979, Ser. No. 9,726

Int. Cl.³ G10G *7/00*

U.S. Cl. 84—458 **2 Claims**



1. A method of tuning a drum using a torque device having a housing with a rotatable shaft including gripping means and torque indicating means responsive to the torque applied to the rotatable shaft, the drum having tension rods coupled between a drum head and a drum shell for applying tension to the drum head the method comprising: applying said torque device to said tension rods by engaging said gripping means with each of said tension rods in turn; turning the housing of said torque device in a direction to partially loosen each tension rod; and then turning the housing in the opposite direction until a desired torque is indicated by the indicating means.

4,287,807

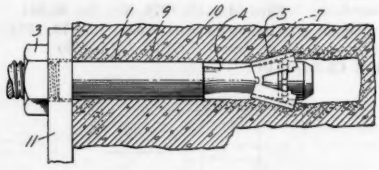
PULL-TO-SET ANCHORING DEVICE

George H. Pacharis, Wyomissing, and Kunissery P. Sadanandan, Reading, both of Pa., assignors to USM Corporation, Farmington, Conn.

Filed Jun. 1, 1979, Ser. No. 44,595

Int. Cl.³ F16B *13/04, 33/04*

U.S. Cl. 411—42 **6 Claims**



1. In a pull-to-set anchor assembly comprising a fastener body having an elongate stem with a head at one end and pulling means at the other end and a reduced axially tapering portion of the stem disposed intermediate of the pulling means and the head, said axially tapering portion having the taper increasing toward the head and terminating as the diameter of the stem is reached and further including a deformable retaining means that is disposed about the tapering portion, said retaining means being greater than the diameter of the stem, said retaining means being arranged to engage an external surface and deform upon actuation of said pulling means wherein an abutment means disposed on the head is arranged to engage and expand the retaining means and limit motion of the stem along the longitudinal axis of the stem, said abutment means comprising an expandable annular member of diameter greater than the diameter of the stem which causes said retaining means to expand.

4,287,808

DRIVE MECHANISM

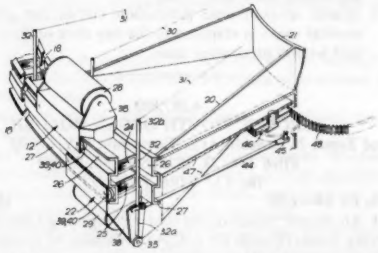
Ian C. A. Leonard, Astley Bridge, and Barry E. Jones, Altricham, both of England, assignors to National Research Development Corp., London, England

Filed Dec. 8, 1976, Ser. No. 748,402

Claims priority, application United Kingdom, Dec. 10, 1975, 50546/75

Int. Cl.³ D04C *3/00*; H02K *41/00*

U.S. Cl. 87—44 **15 Claims**



2. A drive mechanism for driving at least one displaceable element to move around a closed path, comprising:

a linear induction actuator extending adjacent said closed path and substantially entirely around it;

a reaction member for cooperation with said linear induction actuator on said at least one displaceable element, whereby, when said linear induction actuator is appropri-

ately energized, said at least one displaceable element is driven around said closed path;

at least one fixed transducer member associated with said linear induction actuator;

means for feeding an electrical signal to said at least one fixed transducer member;

means for sensing the reactance between said at least one fixed transducer member and said reaction member of said at least one displaceable element which reactance sensing means provides an electrical signal which represents the actual position of said at least one displaceable element with respect to said linear induction actuator;

means for producing at least one demand signal representing the desired position of said at least one displaceable element; and

means for comparing said demand and said actual position signals to produce at least one error signal for controlling the position of said at least one displaceable element over at least a part of said path.

10. A braiding machine incorporating a drive mechanism as in claim **2**, including a first set of carriages formed by a plurality of displaceable elements;

means constraining said first set of carriages to move around a circular path;

a second set of carriages;

means constraining said second set of carriages to move around a circular path;

a plurality of spools of filaments carried one on each of said carriages of said first and second set;

means for guiding filaments drawn from said spools carried by said carriage of said first set over and under filaments drawn from said spools carried by said carriages of said second set, with respect to an axis passing through both centres of said circular paths of said first and second sets of carriages.

4,287,809

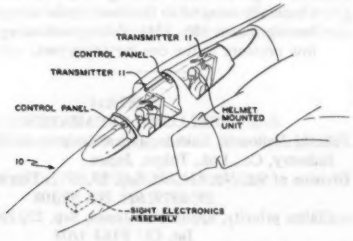
HELMET-MOUNTED SIGHTING SYSTEM

Werner H. Egli, Minneapolis; Dennis Kuhlmann, New Brighton, and Jack E. Wier, Roseville, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 20, 1979, Ser. No. 68,296

Int. Cl.³ F41G *9/00*; G01R *33/02*

U.S. Cl. 89—41 EA **42 Claims**



1. An electromagnetic system for use in determining the orientation of a helmet comprising:

a transmitting antenna for transmitting electromagnetic field vectors, said transmitting antenna having at least two transmitting coils;

a receiving antenna having three non-coplanar receiving coils fixed to the helmet, said receiving coils sensing the electromagnetic field vectors transmitted by said transmitting antenna;

control means for sampling said electromagnetic field vectors sensed by each of said receiver coils, said control means including orientation means for determining the orientation of said helmet using said sensed and said transmitted electromagnetic field vectors, said control means having a first output for supplying said orientation to a utilization means, and a second output;

driving means for supplying driving energy to said transmitting antenna for transmitting said electromagnetic field vectors; and,

selector means connected to said second output from said control means and to said driving means for sequentially energizing said at least two transmitting coils.

4,287,810

DRIVE FOR A PNEUMATIC HAMMER

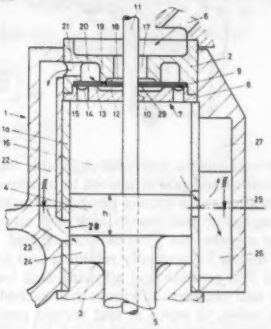
Hans Thoma, Neuhausen am Rheinfall, Switzerland, assignor to SIG - Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 8, 1979, Ser. No. 37,050

Claims priority, application Fed. Rep. of Germany, May 12, 1978, 2820842

Int. Cl.³ F01L *25/02, 21/02*

U.S. Cl. 91—299 **3 Claims**



1. In a pneumatic drive for a hammer tool including a cylinder; a piston slidably received in the cylinder and dividing the inner space of the cylinder into two cylinder chambers; a drive output member formed as a piston rod attached to the piston and projecting from the cylinder; a pressure-responsive valve means for admitting compressed air alternately to the cylinder chambers; means defining discharge openings in the cylinder wall for releasing compressed air alternately from the cylinder chambers dependent upon the position of said piston with respect to the discharge openings; the improvement wherein said discharge openings consist of a plurality of spaced, serially arranged cylindrical ports each having a diameter that equals at least one half of the height of said piston measured in the direction of its reciprocation and means defining a first expansion chamber directly communicating with said cylindrical ports and two second expansion chambers each communicating directly with said first expansion chamber.

4,287,811

BRAKE BOOSTER

Masayoshi Katagiri, Toyota, and Osamu Ogura, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed Aug. 31, 1979, Ser. No. 71,489

Claims priority, application Japan, Feb. 28, 1979, 54-22633

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—369 A **9 Claims**

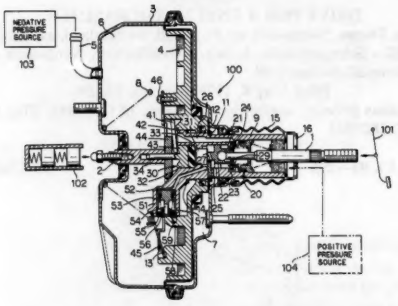
1. A brake booster of the stroke enlarging type comprising:

a power piston disposed in a casing to divide an area within the casing into two chambers, said power piston moving in accordance with the difference of pressures in said chambers on opposite sides of said power piston and being movable for a predetermined distance relative to a control piston,

a control valve for controlling the pressure difference in said

chambers in accordance with the operation of an input member, to enable an output member to obtain a larger stroke than the stroke of the input member at least during the initial stage of the braking operation,

a locking member movably retained by one of said power piston and said control piston and an engagable member provided on the other of said power piston and control piston, said locking member being movable by said pressure difference in said chambers between a first position



out of engagement with said engagable member allowing said control and power pistons to be movable relative to one another and a second position into engagement with said engagable member to lock said control and power pistons together for joint movement; and

resilient means for normally retaining said locking member at said first position and allowing said locking member, when said pressure difference has exceeded a predetermined value, to move to said second position to engage with said engagable member.

4,287,812

CONTROL VALVE

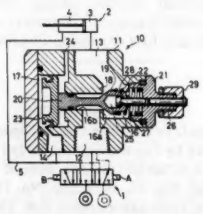
Tomomitsu Iizumi, Tokyo, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 826,251, Aug. 19, 1977, Pat. No. 4,192,346. This application Sep. 20, 1979, Ser. No. 77,475

Claims priority, application Japan, Aug. 25, 1976, 51/113601; Sep. 10, 1976, 51/121042; Oct. 8, 1976, 51/134892; Oct. 27, 1976, 51/144311; Oct. 27, 1976, 51/144312; Jul. 5, 1977, 52/88168

Int. Cl.³ F15B *13/042*

U.S. Cl. 91—420 **7 Claims**



1. A control valve particularly adapted for use together with a direction-changeover valve and with an actuator cylinder having therein an actuator piston with a first and a second actuator chamber defined on opposite sides of said piston, said direction changeover valve operative through said control valve to control fluid pressure in said first and second actuator chambers thereby to control movement of said piston, said control valve comprising: means defining a fluid flow passage between said first actuator chamber and said direction-changeover valve; valve means including a valve body and a valve seat defining a constriction therebetween within said fluid flow passage operating to control fluid flow therebetween said first actuator chamber and said direction-changeover valve; resilient means biasing said valve body toward said valve seat in a direction to reduce said constriction thereby tending to constrict fluid flow through said fluid flow passage between said first actuator chamber and said direction-changeover valve; and pilot piston means responsive to fluid pressure in said second actuator chamber acting against said resilient means to tend to open said constriction in said fluid flow passage with increased fluid pressure in said second actuator chamber.

4,287,813

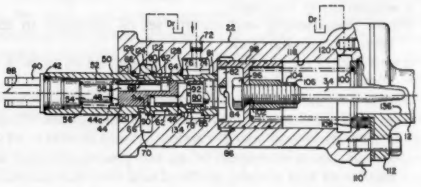
TWO-STAGE CONCENTRIC HYDRAULIC BRAKE BOOSTER

Probir K. Chatterjea, Mt. Prospect, and Daniel B. Shore, Niles, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Dec. 20, 1979, Ser. No. 105,692

Int. Cl.³ F15B *13/042, 13/14*

U.S. Cl. 91—434 **12 Claims**



1. For use in hydraulically supplied, brake booster mechanism, disposed between brake pedal actuated means (**40**) and a power piston (**98**) thereof, actuatable by the metered hydraulic output of an actual fluid pressure:

an interposed, concentric, hydraulic boost control (**22**) comprising telescoping, generally hollow parts one within another, one (**44**) metering the hydraulic output of an actual fluid pressure developed from high and low pressure means of communication thereto;

the other part (**42**) comprising a signal pressure sleeve mechanically secured to the brake pedal actuated means and having means (**66, 134**) of communicating the high and low pressure to the one metering part.

4,287,814

BELLOWS APPARATUS

Takeshi Jinnouchi, Sakado, Japan, assignor to Nippon Oil Seal Industry, Co., Ltd., Tokyo, Japan

Division of Ser. No. 834,445, Sep. 19, 1977. This application Jul. 19, 1979, Ser. No. 59,108

Claims priority, application Japan, Sep. 22, 1976, 51-128026

Int. Cl.³ F16J *3/04*

U.S. Cl. 92—43 **1 Claim**

1. A bellows apparatus consisting essentially of a bellows main body and restriction means for restricting elongation and contraction, said restriction means comprising

a plurality of annular first, second and third guide metals arranged integrally with said bellows main body with a predetermined spacing therebetween in the axial direction;

a plurality of first, second and third guide members each secured integrally to each of said first, second and third guide metals and extending in the axial direction and terminating in edge sections;

a plurality of first, second and third stoppers, each integrally extending in the circumferential direction from the edge section respectively of said first, second and third guide members;

said first and third guide metals being positioned to interpose said second guide metal therebetween and provided, respectively, with first and third guide members that are displaced at said first and third guide metals with respect to each other in the circumferential direction and extend oppositely to each other in the axial direction;

said second guide members comprising a central and two outer guide members displaced circumferentially with respect to each other and with respect to said first and third guide members so that one of each first and third guide members is disposed circumferentially between said central second guide member and one of said outer second guide members, said central second guide member extending axially in both directions from said second guide metal

and said outer second guide members extending axially in opposite directions with respect to each other from said second guide metal;

said stoppers on said first and third guide members comprising two oppositely directed stoppers which overlap circumferentially said second stoppers on said second guide members between which they are disposed;

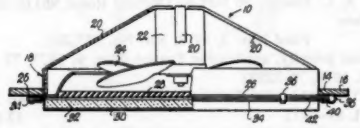
said first, second and third guide members being disposed such that they do not overlap each other in the circumferential direction, and restrict the elongation of said bellows main body by engagement of said first, second and third stoppers, and said first guide member being abutted by said third guide metal and said third guide member being abutted by said first guide metal, when said bellows main body is fully contracted.

4,287,815

COVER ASSEMBLY FOR ATTIC FANS

Richard E. Henderson, 1400 Liggett Rd., Blue Springs, Mo. 64015

Filed Dec. 10, 1979, Ser. No. 101,427
Int. Cl.³ F24F *7/00*
U.S. Cl. 98—43 R **1 Claim**



1. A cover assembly for a fan assembly mounted in an opening in a ceiling, the fan assembly including a vertical frame having a peripheral, laterally extending, normally horizontal rim in face to face engagement with the ceiling circumscribing said opening, the cover assembly comprising:

a shell of dimensions to cover the opening in the ceiling provided for said fan assembly, the shell having a normally horizontal main panel of essentially the same size as said opening, a wall circumscribing said main panel and extending from said panel toward said ceiling in substantial alignment with said frame and a normally horizontal lip circumscribing said wall and extending outwardly therefrom in face to face relationship with said rim when the shell is in place;

said main panel and said wall defining a recess in the shell extending away from said opening and in facing relationship thereto when the cover assembly is in place;

heat insulating material within said recess and filling the same to a level coincident with the plane of said lip;

sealing means between said lip and said rim when the cover assembly is in place; and

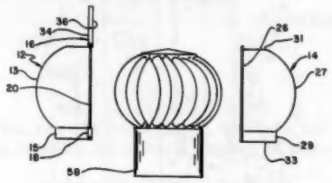
means engaging said lip and said rim for securing the cover assembly to the frame.

4,287,816

VENTILATOR SHROUD

Theodore M. Riccard, 605 Lavon Dr., Altamonte Springs, Fla. 32701

Filed Oct. 11, 1979, Ser. No. 83,599
Int. Cl.³ F24F *13/08*
U.S. Cl. 98—119 **1 Claim**



1. An enclosure for a roof ventilator comprising:

a first semi-hemispherical shell having its uppermost portion closed and its lowermost portion defining a semi-circular opening of substantially smaller diameter than the diameter of said shell and projecting downward from the periphery of said opening is a collar, and wherein said shell includes an outward projecting flange along its outer periphery thereof;

a second semi-hemispherical shell having its uppermost portion closed and its lowermost portion defining a semi-circular opening equal in size to said opening in said first shell and projecting downward from the periphery of said opening is a collar, and wherein said second shell includes an outward projecting flange along its outermost periphery, and wherein said second shell is intimately attachable to said first shell thereby defining a complete enclosure having a contour substantially approximating the contour of the roof ventilator; and

engaging means pivotally attached to said flange of said first shell for engaging said flange of said second shell, said engaging means includes a pivotal channel shaped member and wherein the side flanges of said channel, in the latching mode, overlie portions of said projecting flange for maintaining intimate contact of said flanges.

4,287,817

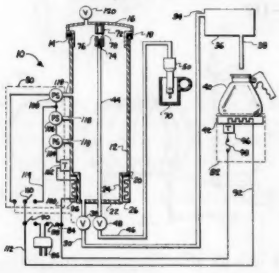
APPARATUS FOR USE IN PREPARING INFUSIONS

Paul M. Moskowitz, Brooklyn; Yuliy Rushansky, Bronx; Lester Brown, Flushing, and Gerald Weinstein, Brooklyn, all of N.Y., assignors to Salton, Inc., N.Y.

Filed Jun. 5, 1978, Ser. No. 912,194
Int. Cl.³ A47J *31/54;* **A23F** *5/00*
U.S. Cl. 99—282 **7 Claims**

1. In an apparatus for use in preparing infusions having an enclosed container, heating means for heating said container, infuser means having an inlet and an outlet, conduit means leading from the bottom of the container to said inlet in which the improvement comprises:

said heating means comprises an electric heating element,
regulating means for operating said heating means at either of two different temperatures sufficient to cause the formation of steam in the top of said container from any water located within said container at a pressure sufficient to force water within the bottom of said container through said conduit means and said infuser means,
said regulating means comprises two separate, normally closed pressure sensitive switches which are capable of opening at different pressures connected in series with said heating element, said separate switches being connected to the interior of said container and being capable of being opened at different pressures within the interior of said container,
said regulating means also including a control switch for removing the one of said pressure sensitive switches which opens in response to the lowest of said pressures from said series circuit,
said regulating means also including a third normally closed pressure sensitive switch which is capable of opening at a



third pressure higher than the pressures at which said two pressure sensitive switches open, said third switch being located in said series circuit so as to be uneffected by said control switch, said third switch being connected to the interior of said container and being capable of being opened in response to pressure within the interior of said container, and including,
second conduit means for conveying steam leading downwardly from the interior of said container adjacent to the top thereof, and
valve means for controlling the movement of steam through said second conduit means,
a temperature responsive vent valve located in the top of said container, said valve being normally open and being responsive to an increase in temperature so as to close, said vent valve being responsive so as to close at a temperature below the temperature at which steam will accumulate in the top of said container at a temperature such that the pressure within said container is sufficient to force water within the bottom of said container through said conduit means and said infuser means to close.

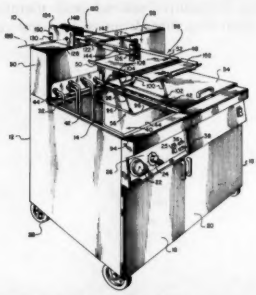
4,287,818

AUTOMATIC FRYER FOR BREADED PRODUCTS

Lewis F. Moore, and George M. Price, both of Shreveport, La., assignors to The Frymaster Corporation, Shreveport, La.

Filed Oct. 23, 1978, Ser. No. 953,910
Int. Cl.[3] A47J *37/12*
U.S. Cl. 99—355 **13 Claims**

1. In frying apparatus of the type including a console and a fry pot mounted on said console having an open mouth for receiving portions of food, the combination with said frying apparatus of a frying rack assembly having portions for maintaining food portions in separate vertical layers and a rack support assembly movably suspended with respect to the open mouth of said fry pot, said rack support assembly and said frying rack assembly having mutually engageable portions permitting detachable coupling arrangement of said frying rack assembly to said rack support assembly, and guiding means coupled to said rack support assembly for guiding said frying rack assembly for movement from an elevated position above the open mouth of said fry pot wherein the frying rack assembly may be engaged or disengaged from said rack support assembly prior to or after completion of a cooking cycle, respectively, to a position inside of said fry pot wherein food



portions contained within the frying rack assembly may be fried during a cooking cycle, said guiding means comprising an elongated support bar having a first end portion pivotally coupled to said console about a fixed axis of rotation and a second end portion pivotally coupled to said rack support assembly, and drive means coupled to said support bar for causing said support bar to rotate about its fixed axis through a vertical plane relative to said console as said frying rack assembly is inserted into or withdrawn out of said fry pot.

4,287,819

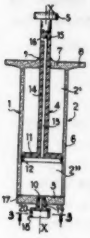
SOURCE OF VACUUM AND DEVICE FOR MAINTAINING A NEGATIVE PRESSURE IN AN ENCLOSURE

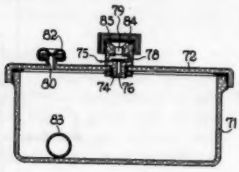
Andre A. C. Emerit, 30 Rue du Docteur Roux, 95110 Sannois, France

Filed Nov. 2, 1978, Ser. No. 957,286
Claims priority, application France, Nov. 9, 1977, 77 33716; Aug. 2, 1978, 78 22802
Int. Cl.[3] A61M *1/00;* B65B *31/04;* B65D *81/20;* F04B *21/00*
U.S. Cl. 99—472 **13 Claims**

1. A source of vacuum comprising: a wall laterally defining a tubular body which has a first end portion and a second end portion and an axis and defines an inner chamber, a piston slidable in the body, a rod connected to the piston, an aperture in the body, the rod extending through the aperture, sealing means interposed between the aperture and the rod, means defining a suction orifice located at least in the vicinity of and parallel to said axis, means for depressing the piston toward the second end portion of the body, and communication means for putting the suction orifice suddenly in communication with a

part of said chamber in the body which is defined by the first end portion and the piston when the piston is depressed relative to the body toward said second end portion and reaches a predetermined position.





4,287,820

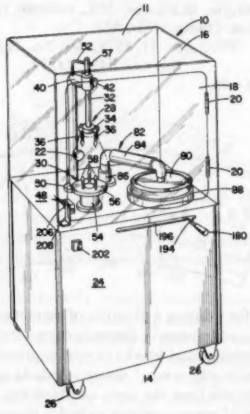
SPIRAL MEAT SLICER

Robert F. Urban, Painesville, Ohio, assignor to National Ham Company, Cleveland, Ohio

Filed Sep. 15, 1978, Ser. No. 943,312

Int. Cl.[3] A23N *7/00*; A47J *17/00*

U.S. Cl. 99—538 **8 Claims**



1. Apparatus for spirally slicing a cut of meat such as a ham or the like comprising:

a support frame;

upper and lower skewer mounting means on the frame for mounting said cut of meat in substantially a vertical position;

means on said frame to rotate said meat relative to said frame;

means for mounting a circular cutting blade on said frame in substantially a horizontal position;

means for rotating said blade;

means to move said blade vertically from a rest position to a first position a slight vertical distance from said rest position in order to clear said lower skewer mounting means;

means to move said blade horizontally from said first position to a second position into slicing engagement with said meat;

means precluding movement of said blade from said first position to said second position until said blade is vertically above said lower skewer mounting means;

means to move said blade vertically from said second position to a third position, said blade being advanced along the axis of rotation of the meat to form a continuous spiral slice in the meat;

signal means signaling approach of said blade to said upper skewer mounting means;

means responsive to said signal means to move said blade horizontally from the third position to a fourth position outward of said third position to clear said upper skewer mounting means;

means to move said blade vertically from said fourth position to a fifth position defining the upper limit of travel of said blade;

means to terminate vertical travel and blade rotation upon the blade reaching said fifth position;

means to move said blade from said fifth position back to the rest position.

4,287,821

ASEPTIC STORAGE TANK

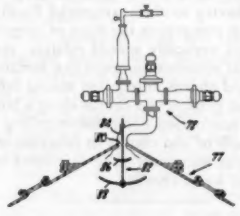
Nobuo Ukai, Machida; Akira Funado, Funabashi, and Tethuya Yokota, Mathudo, all of Japan, assignors to Kagome, Ltd., Japan

Filed Sep. 28, 1979, Ser. No. 80,059

Claims priority, application Japan, Sep. 28, 1978, 53-118623; Sep. 28, 1978, 53-118627

Int. Cl.[3] A23P *1/00*

U.S. Cl. 99—646 C **7 Claims**



1. An aseptic storage tank for germ-free storage of partially processed food products comprising, an upright tank having a conical top portion defining an inlet into said top portion for introducing a fluid semi-processed food product into the tank, the conical top portion including an upper inlet apex, a removable manhole plate mounted below said apex, and connecting means connecting said manhole plate to said upper inlet apex, the inner surfaces of said conical top being smooth and flush, an inspection plate defining a closed peephole on said conical top portion, inner surfaces of said inspection plate being smooth and free of recesses, said inlet apex constituting a sole opening for introducing the fluid food product and cleaning fluids into the interior of said conical top portion and into the interior of said tank, a dispersion device disposed suspended in fixed position below and spaced downwardly from the inlet opening interiorly of said tank within said conical top portion for dispersing and homogenizing a fluid while it is being introduced as a flow into the tank through the inlet opening, said dispersion device comprising suspended disc means disposed under the inlet opening with a periphery thereof spaced inwardly from interior wall surfaces of said conical top portion

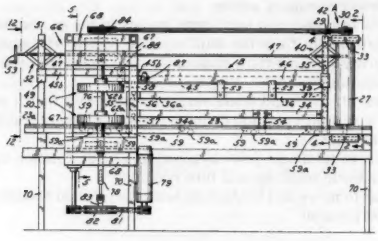
and having upper surfaces spaced downwardly from said inlet and shaped to receive the flow of fluid and splash and direct it upwardly toward the top of the conical top portion and outwardly onto the inner surfaces of the conical top portion, and said device comprising means suspending said disc.

4,287,822

TRUSS ASSEMBLY MACHINE

Donald M. Bowser, Barrie, Canada, assignor to Truswal Systems Corporation, Madison Heights, Mich.

Filed Jan. 8, 1980, Ser. No. 110,366
Int. Cl.³ B30B *3/04*
U.S. Cl. 100—35 **34 Claims**



1. Truss assembly apparatus for securing toothed connector plates to sides of vertically spaced wood chords comprising vertical axis longitudinally fixed roller means for progressively pressing said connector plates with teeth placed against said chords ahead of said roller means into wood penetrating assembled relation as they pass said roller means, means for maintaining said chords in required spaced relation, and means for driving said chords in said required spaced relation together with said connector plates past said side roller means.

18. A production method for assembling trusses constructed of spaced parallel wood chords connected by stamped sheet metal elements having toothed extremities fixedly penetrating said wood chords comprising the steps of prepositioning said chords in parallel vertically spaced relation, positioning the extremities of said elements on respective horizontally spaced sides of said wood chords in required spaced relation to each other, driving and guiding said chords along a horizontal path, and applying synchronized compressive rolling pressure adjusted to the width of said chords to progressively force said toothed extremities into penetrating assembled relation along the length of said wood chords.

4,287,823

SLUSH PULP BALER

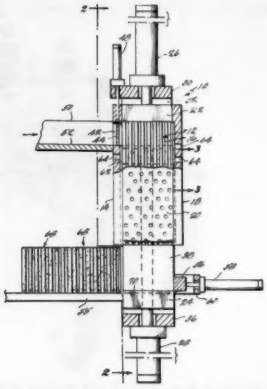
Wallace M. Thompson, Cordele, Ga., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Filed Dec. 11, 1979, Ser. No. 102,350
Int. Cl.³ B30B *9/06*
U.S. Cl. 100—129 **14 Claims**

1. In a press for forming self-supporting bales of fibrous material from pulpy masses of the same containing a high percentage of liquid, such as slush-pulp, the combination comprising:

means defining a closed baling chamber having at least a pair of opposed generally rectangular walls, one of which is movable toward the other to compress material in said chamber, and having at least a third fixed wall along which said one wall is movable; and

drainage means for liquid in said chamber comprising a plurality of narrow grooves in the inner sides of said third wall extending in the direction of movement of said one wall, the mouth of each of said grooves being of uniform width throughout its length and at least as wide as the width of said groove inwardly of said mouth, and spaced holes in said third wall unobstructedly and directly communicating the bottoms of said grooves, at spaced intervals therealong, with the exterior of said chamber, said third wall being of generally uniform thickness throughout except for said grooves and holes, whereby fibrous solids in fibrous material having a high liquid content in said chamber form rib-like formations in said grooves that



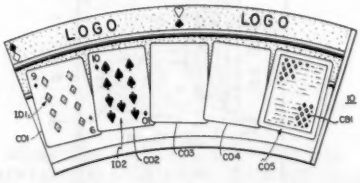
block passage of fibrous solids through said holes but permit liquid to drain through said rib-like formations and through said holes, and the rib-like formations are and remain integral with a bale formed in said chamber on removal of such bale from said chamber by movement in said direction.

4,287,824

MEANS FOR IMPRINTING MULTIPLE PERMUTATIONS AND COMBINATIONS OF CARDS ON CUPS

Patrick T. Boyle, Baltimore, Md., assignor to Maryland Cup Corporation, Owing Mills, Md.

Filed Apr. 11, 1979, Ser. No. 29,073
Int. Cl.³ B41F *13/54*
U.S. Cl. 101—45 **7 Claims**



1. Means for printing a plurality of container sidewall blanks in sequence and transverse disposition on a strip of stock material and providing said blanks in said sequence with combinations of generically related discrete indicia such that no two successive blanks bear the same combination, comprising:

a plurality of rotary printing cylinder means having at least one axially extending printing zone in alignment for printing in sequence on a strip of stock material;

said discrete indicia occupying at least two discrete longitudinally spaced positions on said sidewall blanks;

said plurality of printing cylinders corresponding in number to said discrete indicia, at least one of said printing cylinders including art copy for said sidewall in addition to a respectively associated one of said discrete indicia;

a plurality of peripherally disposed printing plates extending longitudinally of said printing cylinders and transversely of said printing zones and said strip stock, each said print-

ing plate corresponding to a single sidewall blank to be printed;

each said printing plate including at least one font position corresponding to a discrete one of the spaced positions of said discrete indicia and all of the printing plates on a given one of said printing cylinders defining the same discrete spaced position for the discrete indicia borne thereby;

said printing cylinders each containing a different number of printing plates defining the circumference of its corresponding printing area;

said printing plates being of identical dimension; and

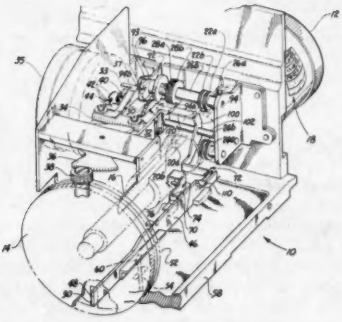
said printing cylinder means being rotated at the same peripheral velocity to cause successive impressions of said printing plates on said stock from a given one of said printing cylinder means to be in mutual registry with impressions made by corresponding plates on the other of said printing cylinder means.

4,287,825

PRINTING CONTROL SYSTEM

Alton B. Eckert, Jr., Norwalk; Richard A. Malin, Westport; Robert B. McFiggans, Stamford, and Leonard M. Pengue, Huntington, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 30, 1979, Ser. No. 89,412
Int. Cl.³ B41J *1/22*
U.S. Cl. 101—91 **8 Claims**



1. A printing control system comprising:

means for printing postage having a plurality of separately settable print elements, said postage printing means settable to print a plurality of different postage amounts and adapted to be energized by a source of operating energy to print postage;

energizing means operably coupled to said postage printing means for energizing said printing means to print postage;

postage setting means including a gear rotatably mounted and movable to be selectively operably connected to each of said settable print elements of said postage printing means for changing the postage amount setting of said postage printing means to a selected postage amount of said plurality of different postage amounts;

a shutter means which can be moved into and out of a position to block said means energizing from energizing said postage printing means to print postage;

interposer means for holding said shutter means in said blocking position; and

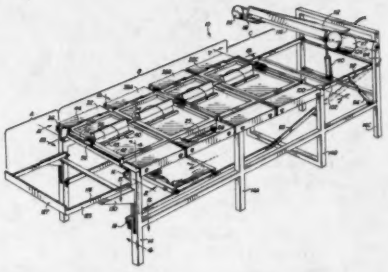
means adapted to be engaged by said postage setting means gear for moving said interposer means into and out of said position holding said shutter means in said blocking position.

4,287,826

METHOD AND APPARATUS FOR SCREEN PRINTING

Michael W. Brabec, 6135 N. 5th Pl., Phoenix, Ariz. 85012

Filed Mar. 30, 1979, Ser. No. 25,672
Int. Cl.³ B41F *15/04*; B05C *17/06*
U.S. Cl. 101—115 **6 Claims**



1. A screen printer for applying a design to a workpiece using a printing medium comprising:

(a) a printing section having a frame including:

(i) a first horizontal track on said frame and a second spaced-apart return track disposed subjacent said first track and generally parallel thereto;

(ii) a plurality of printing heads disposed adjacent said first track defining printing stations, said printing heads having squeegee means associated therewith for applying a printing medium to the workpiece;

(b) a drying section contiguous and aligned with said printing section and including:

(i) a moveable receiving track having a first position in alignment with said first track of said printing section and moveable to a second position aligned with the said second track of said printing section;

(ii) heating means moveable from a first position to a second drying position adjacent the said receiving track in said first position; and

(c) carrier means moveable along said tracks, said carrier means including platen means associated therewith for receiving a workpiece whereby the workpiece may be placed on said platen means on said carrier means and advanced through said printing section for application of a printing medium at each of the said stations in said printing section to said drying section and thereafter transferred to said second track at said receiving track by moving said receiving track from said first position to said second position to be returned along said second track whereby the operator can remove the completed workpiece and replace the workpiece with a new workpiece.

4,287,827

COMBINED INKING AND MOISTENING ROLLER

Gordon R. Warner, 5624 Stow Canyon Rd., Goleta, Calif. 93017

Filed May 17, 1979, Ser. No. 39,785
Int. Cl.³ B41F *7/36, 31/06*
U.S. Cl. 101—141 **5 Claims**

1. In a lithographic printing press, the combination of:

(a) a printing press fountain having a blended mixture of water and oil-based ink;

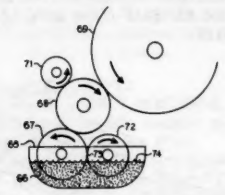
(b) a fountain roller contacting the water and ink mixture;

(c) and a squeegee roller contacting the fountain roller to limit the amount of water and ink mixture carried by the fountain roller;

(d) a lithographic printing plate separate from the fountain roller;

(e) and means to transport the particles of water and ink from the fountain roller to the lithographic printing plate, characterized by said fountain roller having a lithographic

surface of intermixed hydrophilic and oleophilic areas, whereby the fine particles of ink and water are selectively



taken from the fountain and transported in measured proportions to properly ink and dampen the plate cylinder.

4,287,828

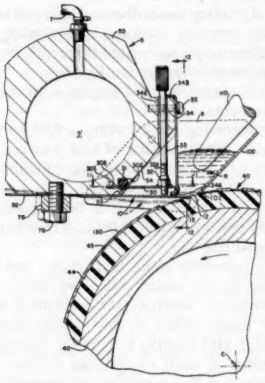
INK METERING APPARATUS

Harold P. Dahlgren, 726 Regal Row, Dallas, Tex. 75247

Continuation of Ser. No. 795,292, May 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 779,647, Mar. 21, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 25,802

Int. Cl.³ B41F *31/04, 27/06*

U.S. Cl. 101—363 **7 Claims**



1. A method of forming a thin film of printing ink on a resilient form roller surface urged into pressure relation with a printing plate, wherein an excess of ink is applied to a portion of the form roller surface carrying a film of ink of irregular thickness, the improvement comprising the steps of: providing a resilient cantilever metering member supported at one end; positioning a flexible support surface lying between a metering edge and a trailing edge on the other end of said metering member in pressure indented relation with ink and said resilient roller surface such that the metering edge is indented further into the roller than the trailing edge and the support surface is entirely indented into the resilient roller surface so that ink carried by the roller surface impinges against a substantially radially disposed metering surface on the metering member adjacent the metering edge; resiliently applying force along the entire length of the support surface for resiliently urging the metering edge and the trailing edge in a direction generally radially of the roller to position the metering edge and the trailing edge on the metering member in pressure relation with the resilient roller surface; said step of resiliently applying force including providing resilient pressure adjustment means at spaced locations along the length of the metering member, supporting said resilient pressure adjustment means separate from said metering member so that said resilient pressure adjustment means are biased toward and into contact with said resilient metering member, adjusting the resilient adjustment means so as to deflect the support surface at said spaced locations for thus applying a resilient contacting force to said resilient metering member at spaced locations along the length of the metering member to vary the thickness of the film of ink along the length of the roller while permitting movement of the support surface in a direction radially of the roller to prevent changes in the film thickness around the circumference of the roller as the roller rotates.

4,287,829

CARRIER STOPPING DEVICE FOR POWER-AND-FREE CONVEYOR

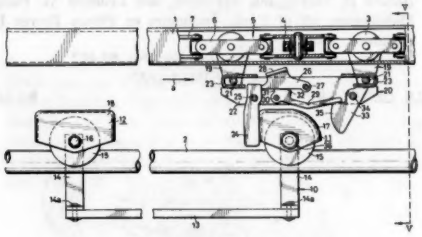
Takao Wakabayashi, Toyonaka, Japan, assignor to Nakanishi Metal Works Co., Ltd., Tenmabashi, Japan

Filed Sep. 26, 1978, Ser. No. 945,795

Claims priority, application Japan, Oct. 5, 1977, 52-134583; Oct. 5, 1977, 52-134584; Apr. 6, 1978, 53-45746

Int. Cl.³ B61B *10/02*

U.S. Cl. 104—172 S **6 Claims**



1. In a power-and-free conveyor including a power rail having a drive chain, a free rail provided below the power rail at a predetermined distance therefrom, both rails extending in a longitudinal direction, a plurality of carriers movably supported by the free rail, each carrier having an engageable portion, a plurality of pusher dogs engageable with the engageable portion of the carriers, a pusher dog supporting member attached to the drive chain, and a disengaging means located at a position where the carrier is to be brought to a stop, the pusher dogs each being pivotably supported at an upper portion thereof on the pusher dog supporting member, the improvement wherein, the pusher dog supporting member includes a stopper pivoted at its front end, a stopper receiving means for normally supporting the stopper in a substantially horizontally directed position, a stopper raising lever pivoted at its rear end below the stopper, and a lever receiving piece pivotally supported rearwardly and upwardly, wherein the rear end of the stopper is in engagement with the top of the pusher dog, the stopper has a pusher dog disengaging portion extending outwardly therefrom, the stopper raising lever has a stopper receiving portion and a stopper raising portion, each of these portions upwardly extending from the rear portion of the stopper raising lever, and the lever receiving piece has a receiving portion on which the front free end of the stopper raising lever is received, wherein the stopper receiving portion stands just above the pivot point of the stopper raising lever and the stopper raising portion is positioned in front of the pivot point, and wherein the disengaging means includes a disengaging lever rotatable through a predetermined angle taken in the longitudinal direction of the power rail and the free rail, the disengaging lever having an upper piece with a stopper raising means mounted thereon, the upper piece extending forward of the power rail.

4,287,830

VEHICLE ADAPTED TO BE GUIDED ON TRACKS FOR THE PUBLIC LOCAL PASSENGER TRAFFIC WITH PIVOTAL REAR AXLE AND LONGITUDINAL GUIDE MEMBERS FOR SUCH AXLE

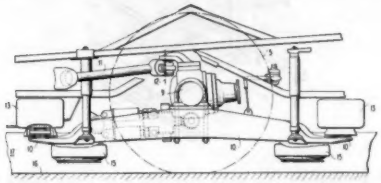
Dieter Braun, Weinstadt; Herbert Mehren, Ludwigsburg, and Helmut Wulf, Ostfildern, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 20, 1979, Ser. No. 22,324

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1978, 2813700

Int. Cl.³ B62D *1/26*

U.S. Cl. 104—247 **12 Claims**



1. A vehicle adapted to be selectively operated with or without guide rails or tracks, the vehicle including a steerable vehicle axle means having steerable wheels mounted thereon and at least one non-steerable vehicle axle means having non-steerable wheels mounted thereon, means for mounting the non-steerable vehicle axle means so as to be pivotable in its entirety about a centrally positioned vertically extending pivot axis, spring means for suspending a superstructure of the vehicle, and spring bracket means fixedly mounted to an axle body for the non-steerable vehicle axle means for mounting the spring means to the vehicle, characterized in that ring mount segment means are provided for mounting the spring means at outer ends of the spring bracket means so as to be horizontally movable, at least two supporting roller means each having an axis of rotation disposed approximately toward a pivot center of the non-steerable axle means are attached to an underside of the spring means, said supporting roller means being adapted to roll along a flat top surface of the ring mount segment means, at least one of a shape-mating lateral guide means and a safety means arranged on both sides of the supporting roller means adjacent a mounting means for the supporting roller means, the guide means are adapted to engage lateral edges of the ring mount segment means on a freely projecting underside of the ring mount segments, said safety means lying in a lateral groove means provided in a shoulder of the ring mount segment means formed at the mounting means for the supporting roller means.

4,287,831

FRICTION AND RACK AND PINION LOCOMOTIVE

Laszlo Farkas, Am Hang 31, 4713 Bockum-Hövel, Fed. Rep. of Germany

Continuation of Ser. No. 817,105, Jul. 29, 1979, Pat. No. 4,133,267. This application Sep. 12, 1978, Ser. No. 941,454

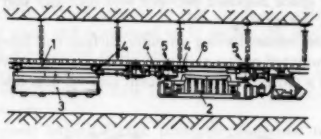
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632506

The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.

Int. Cl.³ B61B *3/00, 13/02;* **B61C** *11/04, 13/04*

U.S. Cl. 105—29 R **10 Claims**

1. In a suspended railroad, a combination comprising a monorail having an elongated friction section and an elongated rack section, one of said sections being superimposed upon the other section; at least one car suspended on said monorail; and drive means for moving said car along said rail, said drive means comprising a friction wheel in frictional engagement with said friction section, a gear wheel coaxial with said friction wheel and movable in axial direction relative to the latter between an active position engaged with said rack section and an inactive position disengaged therefrom, means for moving said gear wheel between said positions thereof and comprising an elongated hollow shaft coaxially projecting from said gear wheel and forming a double-acting cylinder, stationary piston means in said cylinder and dividing the interior thereof in an upper and lower pressure chamber, means for switching fluid



under pressure between said chambers to thereby move said gear wheel between said positions thereof, support means supporting said friction wheel and said gear wheel with said hollow shaft for rotation about a common axis, and means operatively connected to said friction wheel and said gear wheel for simultaneous rotating the same about said common axis.

4,287,832

TRANSVERSELY TORSIONALLY INTERCONNECTED RAILWAY VEHICLE TRUCKS

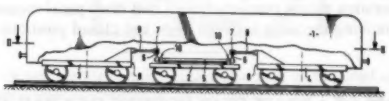
Ernst Kreissig, Seuzach, and Friedrich Steinmann, Weisslingen, both of Switzerland, assignors to Schweizerische Lokomotive- und Maschinenfabrik, Winterthur, Switzerland

Filed Jul. 10, 1978, Ser. No. 923,298

Claims priority, application Switzerland, May 9, 1978, 4997/78

Int. Cl.³ B61F *3/08, 5/44, 5/50*

U.S. Cl. 105—176 **13 Claims**



1. In combination with a rail vehicle having at least two longitudinally spaced trucks for supporting a body; a transverse coupling assembly for coupling said trucks comprising

a hollow shaft disposed longitudinally of said trucks and said vehicle,

bearing means supporting each end of said shaft relative to said body;

a torsion spring element extending within said shaft at least over one end section, said spring element being secured at one end to said shaft and being relatively rotatable at an opposite end to said shaft within a predetermined angle; and

a pair of linkages, each linkage connecting a respective one of said trucks to a respective end of said shaft and including a lever secured to said torsion spring element and connected to a respective one of said trucks.

4,287,833

AUTO CARRIER RAILWAY CAR

David J. Roldness, San Diego; Felixberto A. Galasan, Chula-Vista, and Thomas H. Watson, Bonita, all of Calif., assignors to Pullman Incorporated, Chicago, Ill.

Filed Sep. 19, 1979, Ser. No. 77,255

Int. Cl.³ B61D *19/00, 17/06, 3/02*

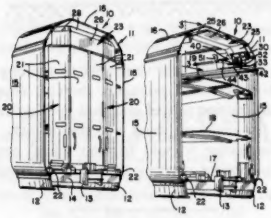
U.S. Cl. 105—378 **14 Claims**

1. In a railway car having a body including side walls and a roof structure,

said body having at least one open loading end including one or more cargo supporting platforms adapted to be loaded with cargo through said open end, and a door arrangement for said open end including a pair of vertical doors, adapted to be moved between open and closed position,

the improvement of an upper door arrangement on said body supported above said vertical doors for closing an upper space disposed between said roof and said vertical doors, comprising

door panel means having an outer surface and being pivotally mounted above said vertical doors and movable between a closed position adjacent said vertical doors to an



open position away from said vertical doors whereby the outer surface of the door panel means is disposed in a position facing the inside of the car roof structure,

supporting means supporting said door panel means solely for rotating movement on said body about a generally horizontal axis extending substantially parallel to and spaced inwardly of said open end of said body,

said door panel means being rotatably movable about said supporting means from an open position substantially entirely recessed within said body to a closed position substantially closing said upper space, and

operating means connected with said door panel means for moving the same between open and closed positions.

4,287,834

STOPS OF A DRAFT GEAR HOUSING OF A RAIL CAR CENTRAL COUPLER ARRANGED IN A CENTER SILL

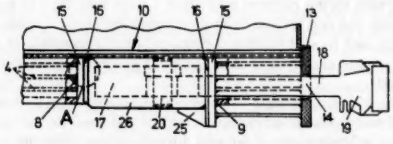
Jürg Zehnder, and Erich Neumeier, both of Zurich, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 25, 1979, Ser. No. 60,349

Claims priority, application Switzerland, Feb. 5, 1979, 1100/79

Int. Cl.³ B61F *1/00, 1/08*

U.S. Cl. 105—420 **10 Claims**



1. In a sill of a rail car having stops for a draft gear housing of a central coupler in at least one space in said sill, said draft gear housing being secured in said space, wherein the said sill is provided with longitudinal struts or ribs discontinuous at said space, and including front stops and rear stops for pushing and pulling the draft gear, provided that said stops are integral components of the sill, are provided at the location of the discontinuity and the front stops and the rear stops for the draft gear are created by removing material from the sill or struts, wherein said stops meet the tractive and compressive forces arising in use.

4,287,835

SLIPPER TRAY AND FOOTREST

David W. Stratton, 1901 Tradewinds La., Newport Beach, Calif. 92660

Filed Jul. 31, 1978, Ser. No. 881,496

Int. Cl.³ A47B *85/00*

U.S. Cl. 108—26 **1 Claim**

1. A pivotable combination footrest and slipper tray attached to the base of an over-the-bed table by means of brackets attached to the ends of said footrest and slipper tray, said brackets being of such shape as to include two flanges which extend downward to enclose a structural member of the base of such over-the-bed table, screws extending through both flanges of said brackets to attach said bracket to said structural member, said screws being retained in place by means of nuts and washers, the shape of such mounting bracket being tailored to the size and shape of said structural member of the over-the-bed table, said footrest and slipper tray being made pivotable with respect to said mounting brackets and over-the-bed table by means of centrally located pivot shafts attached to the ends of said combination footrest and slipper tray and extending through vertical flanges of said mounting brackets, the ends of said pivot shafts being clamped to said vertical flanges of said brackets by means of plain washers, lockwashers, and capnuts in such a manner as to permit the footrest and slipper tray to pivot with the application of foot pressure, the amount of friction required to pivot said footrest and slipper tray being adjustable by the amount of torque applied to said capnuts and lockwashers, spring loaded plungers having non-skid end caps on their lower ends being contained within cylindrical housings attached to each side of said footrest and slipper tray mounting brackets to maintain the combination footrest and slipper tray in a horizontal position or to lock the over-the-bed table in place, said springs being compression springs and so located and loaded as to apply a force between the bottom of the cylindrical plunger housing and a flange on the plunger, said force being applied in such a manner as to force an upper spherical end of said plunger against the bottom of said footrest and slipper tray, said plungers being located on opposite sides of said footrest and slipper tray pivot point to apply spring loaded equal and opposite forces against the bottom of said tray, thereby maintaining such tray in a horizontal position, the application of pressure eccentrically about the tray pivot point and downward to the top of said footrest and slipper tray causing said tray to pivot, thereby forcing said plungers downward against the surface upon which the over-the-bed table rests, such downward pressure creating friction between the plunger and said surface thereby locking the over-the-bed table in place and preventing said table from moving, the footrest and slipper tray being pivotable either clockwise or counter clockwise about its pivot point causing the over-the-bed table to be locked in place with the application of said pressure on either side of said pivot point.

4,287,836

PALLET MADE OF SYNTHETIC RESIN

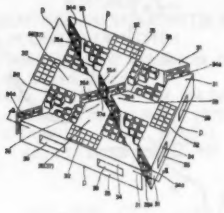
Hisashi Aoki, Kaiseimachi, Japan, assignor to Kabushiki Kaisha Meiji Gomu Kasei, Tokyo, Japan

Filed May 24, 1979, Ser. No. 42,152

Claims priority, application Japan, Jun. 3, 1978, 53-67100; Jun. 3, 1978, 53-67101

Int. Cl.[3] B65D *19/32*

U.S. Cl. 108—51.1 7 Claims



1. A pallet made of a synthetic resin and comprising four corner posts, intermediate posts provided between said corner posts, a center post, hollow edge boards connecting said corner posts and said intermediate posts, hollow deck boards provided in a crossed manner to connect said intermediate posts and said center post together, and fork inserting openings provided at the four sides of said pallet, wherein four identical complementary pallet elements are combined together along two crossed division lines on said pallet, said elements being provided with edge boards and deck boards, with flat walls provided at both ends of each of said edge boards and deck boards so as to form a closed hollow space in each of said elements, and reinforcing ribs provided in the hollow space in each of said edge boards such that said reinforcing ribs are extended in parallel with the side surfaces of said pallet and disposed such that said reinforcing ribs meet with one another at right angles in the four corners of said pallet, said reinforcing ribs and said upper and lower flat walls in each of said pallet elements being butt fused together.

4,287,837

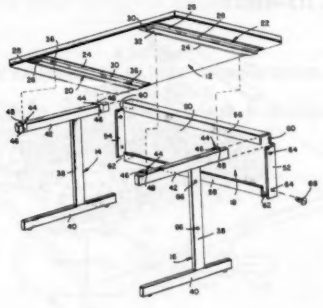
FURNITURE ASSEMBLY

Richard A. Bayles, 8 Idlewild Park Dr., Cornwall-on-Hudson, N.Y. 12520

Filed Nov. 30, 1979, Ser. No. 98,753

Int. Cl.[3] A47B *3/06, 17/00*

U.S. Cl. 108—154 8 Claims



1. A furniture assembly comprising

a table top having a flat bottom surface

a plurality of elongated leg-support members secured to the bottom surface of said table top in parallel, spaced relationship to each other,

each of said leg-support members having a plurality of spaced slots formed in one side thereof,

a plurality of leg members, each comprising an upright portion and an upper elongated portion formed rigidly with said upright portion and extending perpendicularly thereto at the upper end thereof,

a plurality of tabs secured to said upper elongated portions and sized and positioned to fit within the slots of one of said leg-support members,

a panel adapted to be mounted between said leg members in an upstanding position beneath and perpendicular to said table top,

said panel having flange portions positioned to abut the upright portions of the respective leg members, and

snap-fitting attachment means for connecting said flange portions to said leg members to maintain said leg members in a fixed relationship when said leg members are assembled with said table top.

4,287,838

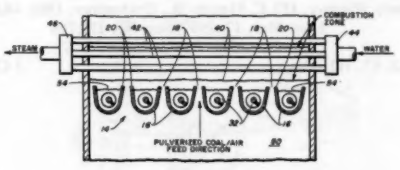
FLUIDIZED BED COAL COMBUSTION REACTOR

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Philip I. Moynihan, La Canada, and Donald L. Young, Pasadena, both of Calif.

Filed Dec. 15, 1978, Ser. No. 969,759

Int. Cl.[3] F23B *7/00*

U.S. Cl. 110—234 8 Claims



1. A reactor for combusting a suspension of fluidized carbonaceous fuel comprising in combination:

wall means defining a vertical reaction chamber;

a horizontal grid of upwardly facing channels which are arcuate in shape with outwardly diverging upper ends, said channels being mounted in said reaction chamber with preselected spacing between the channels defining elongate nozzle openings;

ash removal means mounted in each of said channels;

means for injecting a suspension of carbonaceous fuel into said reaction chamber below said grid whereby said suspension is injected through said openings into a combustion zone above said grid; and

means for removing combustion gases from said chamber.

4,287,839

APPARATUS FOR LINING THE INNER WALLS OF INDUSTRIAL FURNACES

Manfred Severin, Schwerte-Geisecke, and Hans-Dieter Marsch, Dortmund, both of Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 98,929

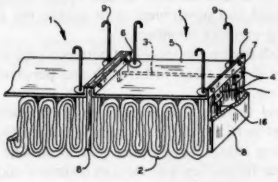
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1978, 2856441

Int. Cl.[3] E04B *1/80;* C04B *43/02*

U.S. Cl. 110—331 6 Claims

1. A lining for the inner walls of industrial furnaces comprising a plurality of insulating blocks, each block comprising an insulating mat which is folded in corrugated manner, said insulating mat being made of highly heat-resistant material, especially ceramic fibrous material; carrying elements pene-

trating the folds of the corrugations on one side of said insulating mat; a base plate provided on the outside of each said insulating block, said base plate having at least two webs extending outwardly and disposed on opposite sides of said base plate; means disposed on said base plate on the side opposite said webs for connecting said carrying elements to said base plate; and means rotatably attached to said base plate for sus-



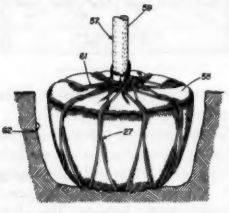
pending each said insulating block from the walls of the furnace, said fixing means comprise hooks and including holding means attached to the furnace walls, said holding means comprising holding bars and said carrying elements comprise at least two carrying bars that penetrate all folds of said insulating mat and said connecting means comprise lugs extending from said base plate for connecting said carrying bars to said base plate.

4,287,840

TREE TRANSPLANTING METHOD AND APPARATUS THEREFOR

Barry Weidner, 153 E. Marion St., Doylestown, Ohio 44230

Filed Mar. 17, 1980, Ser. No. 131,208
Int. Cl.[3] A01C *11/00;* **A01G** *23/02*
U.S. Cl. 111—1 **3 Claims**



1. An improved method of packaging and transplanting trees including the steps of:

(a) forming a drum lacing of fibrous rope material having a circular rope base and a plurality of closed end rope loops connected to the base and extending radially outwardly from said base;

(b) providing an open top wire basket formed by two half-basket sections detachably joined together to form a downwardly, inwardly sloping interior;

(c) suspending the drum lacing within the wire basket by said closed end loops;

(d) placing a sheet of flexible material over the drum lacing and open top of the basket;

(e) placing the roots of a tree and attached ball of soil into the basket;

(f) wrapping the sheet of flexible material about the ball of soil and tree roots;

(g) tying the drum lacing loops about the sheet of flexible material and to the trunk of the tree to securely confine the tree roots and soil ball within the sheet of material;

(h) detaching the wire basket and removing the wrapped tree therefrom;

(i) transporting the tree to a transplanting site; and

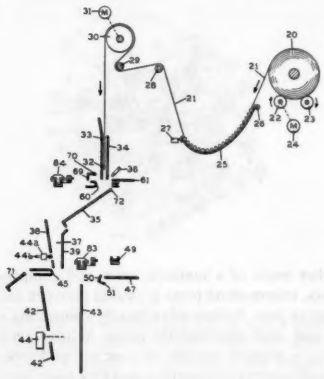
(j) replanting the wrapped tree at said transplanting site.

4,287,841

APPARATUS FOR CUTTING AND HEMMING BED SHEETS AND THE LIKE

Herman Rovin, c/o Automatech Industries Inc., Rte. 3 Box 370A, Piedmont, S.C. 29673

Filed Aug. 6, 1979, Ser. No. 64,096
Int. Cl.[3] D05B *19/00*
U.S. Cl. 112—121.11 **10 Claims**



1. Apparatus for forming and sewing hemmed bed sheets or the like, which comprises,

(a) a supply of web material,

(b) a feed roll for controllably advancing said web material,

(c) guide means for receiving the advanced material by gravity,

(d) control means operative to interrupt the advance of fabric when the leading edge reaches a predetermined location,

(e) means for forming and folding a hem across the full width of the material,

(f) means for gripping the material in the region of the thus formed hem and transporting the material laterally,

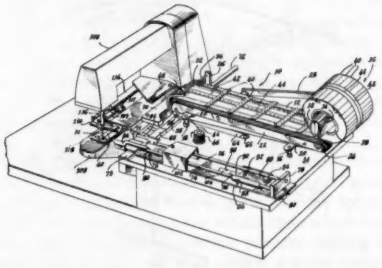
(g) means for sewing the hem during the lateral transport of said material.

4,287,842

AUTOMATIC BELT LOOP TACKER

Louis W. Breck, Jr., Eight Joe Turner Ct., El Paso, Tex. 79915

Filed Sep. 17, 1979, Ser. No. 76,085
Int. Cl.[3] D05B *23/00*
U.S. Cl. 112—121.27 **11 Claims**



1. Apparatus for sewing a belt loop to a garment comprising:

folding means for folding opposite transverse ends of said belt loop back upon itself,

means for feeding an unfolded belt loop on a support adjacent said folding means, and

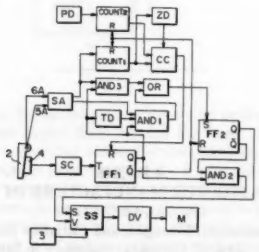
sewing means for tacking a folded belt loop to a garment,
said folding means including
means for reciprocating said folding means to deliver a folded belt loop beneath said sewing means for tacking the folded belt loop to a garment; and
said sewing means including
means for successively positioning the transverse ends of said belt loop beneath said sewing means so that the transverse ends can be sewn to a garment.

4,287,843

ELECTRIC SEWING MACHINE WITH A SPEED CONTROL SYSTEM

Yoshiaki Ozaki, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1980, Ser. No. 114,245
Claims priority, application Japan, Feb. 9, 1979, 54-14882[U]; Feb. 15, 1979, 54-17141[U]
Int. Cl.³ D05B *69/18*
U.S. Cl. 112—277 **3 Claims**



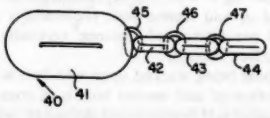
1. A sewing machine with a machine drive motor having an upper drive shaft and a motor speed control system including a variable motor speed control circuit, said motor control system comprising electrically conductive operating means sensing a touch by an operator; a switch means operated by manipulation of the electrically conductive operating means to produce a signal; motor starting and stopping means including bistable functioning means to start the machine drive motor at a predetermined speed when the bistable functioning means receives the signal from the switch means while the machine drive motor is stopped, said motor starting and stopping means operating to stop the machine drive motor when the bistable functioning means receives the signal from the switch means while the machine drive motor is rotating; and extreme lower speed control means operated to drive the machine drive motor at an extreme lower speed when the operating means is touched by the operator while the machine drive motor is driven by the motor starting and stopping means.

4,287,844

BULKY COMPOSITE FABRIC AND METHOD OF MAKING SAME

Thomas L. Weil, Elverson, Pa., assignor to Bentley-Harris Manufacturing Company, Lionville, Pa.

Filed Apr. 24, 1979, Ser. No. 32,960
Int. Cl.³ D05B *93/00*
U.S. Cl. 112—412 **12 Claims**



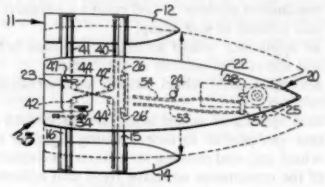
1. A bulky composite fabric having a uniform width throughout its length and composed of a given number of groups of strands of fibrous material, each of said groups of strands being interknitted to form an elongated tubular fabric component, whereby said given number of groups form a given number of said components, said tubular fabric components being juxtaposed and interconnected side-by-side throughout their length in pairs by seams of zigzag stitching extending diagonally alternately between said juxtaposed fabric components, each of said components comprising a knitted fabric tube of small diameter, each said tubular fabric component having a plurality of wales of needle loops extending longitudinally of said fabric, any given wale of needle loops having loops alternating in sequence between loops of first and second strands of fibrous material throughout the length of the fabric, the first of said strands alternately forming needle loops in a wale on one side of the given wale and the second of said strands alternately forming needle loops in a wale on the other side of said given wale a first of said components being fabricated of strands of fibrous material of substantially greater bulk than the strands making up a second fabric component, whereby the thickness of said bulky composite fabric is greater along the line of the first component than along the line of said second component.

4,287,845

SAILBOAT HAVING MULTIPLE HULLS

Sidney N. Sanner, P.O. Box 1173, Tryon, N.C. 28782

Filed Aug. 23, 1979, Ser. No. 69,239
Int. Cl.³ B63B *35/00*; B63H *9/00*
U.S. Cl. 114—39 **8 Claims**

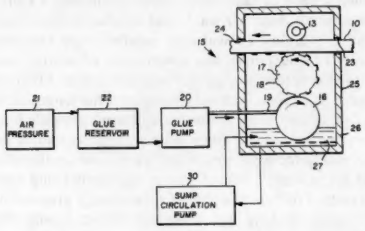


1. A multi-hulled sailboat characterized by the ability to limit heeling under various headings to thereby maximize the effective sail area and speed, and comprising
a hull assembly comprising first and second hulls, and means fixedly interconnecting said hulls in a laterally spaced apart and laterally aligned relationship and including at least one laterally directed beam,
a deck assembly comprising a deck adapted to support the crew of the sailboat, a mast fixed to said deck for supporting a sail, and a third hull mounted to said deck,
means mounting said deck assembly to said hull assembly to permit relative lateral movement therebetween, and so that said three hulls are disposed in a triangular arrangement and are adapted to concurrently support the weight of the sailboat, said mounting means including cable means for limiting canting between said deck assembly and said hull assembly and comprising first and second cables fixedly interconnected between said first and second hulls, with the ends of each cable being fixed to opposite hulls at longitudinally spaced points, and pulley means mounted on said deck assembly and operatively engaging each cable so that each cable includes a medial portion which extends in a direction having a substantial longitudinal component, and
means for effecting relative lateral movement between said deck assembly and said first and second hulls and for maintaining a selected relative position therebetween,
whereby the weight of the deck assembly and crew may be moved toward the windward one of said first and second hulls to minimize heeling of the sailboat.

4,287,846
INTERMITTENT ADHESIVE APPLICATOR

Gary S. Klein, Aurora, Ohio, assignor to Voplex Corporation, Pittsford, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,089
Int. Cl.[3] B05C *1/08, 1/16*
U.S. Cl. 118—212 8 Claims



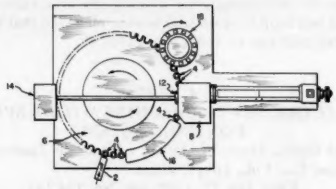
1. An applicator for depositing a solvent-carried adhesive intermittently along a moving strip, said applicator comprising:
   a. a sump arranged below said strip and containing a quantity of the solvent carrying said adhesive;
   b. an adhesive wheel arranged to rotate below said strip and having a lower region immersed in said solvent in said sump;
   c. said adhesive wheel having a continuous peripheral surface for receiving said adhesive;
   d. means for continuously applying said adhesive to said continuous surface of said rotating adhesive wheel above said solvent in said sump;
   e. an applicator wheel arranged to rotate below said strip and above said solvent in said sump;
   f. said applicator wheel having an intermittent peripheral surface;
   g. said applicator wheel being arranged with said intermittent peripheral surface running against said adhesive wheel and said moving strip to receive spaced increments of the continuous adhesive from said adhesive wheel and apply said received adhesive intermittently to said strip while leaving unreceived, spaced increments of adhesive on said adhesive wheel for removal in said solvent in said sump;
   h. means for rotating said adhesive wheel and said applicator wheel at peripheral surface speeds approximately equal to the speed of said strip;
   i. an enclosure enclosing said sump, said adhesive wheel, said applicator wheel, and the region of contact betwen said applicator wheel and said strip;
   j. an entrance and exit for said strip to move through said enclosure in contact with said applicator wheel; and
   k. said enclosure being sufficiently closed to retain a substantially saturated solvent vapor atmosphere within said enclosure to inhibit evaporation of solvent from said adhesive.

4,287,847
APPARATUS FOR DISTRIBUTING LINING MATERIAL IN CAP SHELLS

Hidehiko Ohmi, Hiratsuka, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jun. 25, 1979, Ser. No. 51,505
Claims priority, application Japan, Oct. 7, 1978, 53-82888
Int. Cl.[3] B05C *7/00;* B29D *31/00;* B29F *3/00*
U.S. Cl. 118—215 4 Claims

1. An apparatus for distributing lining material in cap shells where the apparatus has a cap shell transport means for moving cap shells at a predetermined speed along a path, a lining material extrusion means positioned above and along said path for extruding a predetermined amount of lining material through an extrusion passage, a rotatable lining material cutting knife positioned adjacent the exit end of said extrusion passage adapted to move across lining material extruded from said passage to cut the same, drive means for rotating said knife, and a transmission means operatively connecting said

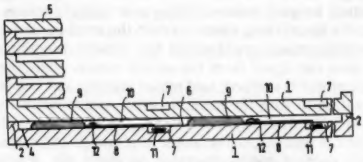


drive means to said knife; the improvement comprising in that said transmission means contains at least two sets of non-circular gear pairs and wherein the relative angle between the said two sets of gear pairs is adjustable.

4,287,848
APPARATUS FOR THE MANUFACTURE OF EPITAXIAL $Ga_{1-x}Al_xAs$:Si FILM

Siegfried Leibenzeder, Erlangen, and Christine Heindl, Mantel, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 12, 1979, Ser. No. 84,155
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1978, 2847091
Int. Cl.[3] B05C *5/00*
U.S. Cl. 118—401 3 Claims



1. An apparatus for use in the manufacture of epitaxial $Ga_{1-x}Al_xAs$:Si by liquid phase epitaxy comprising:
   a first horizontally disposed graphite boat having a substantially flat lower surface, a substantially flat upper surface having at least one depression therein, adapted to receive Al, and rims at each end of said boat projecting a substantially identical pre-determined distance vertically above said upper surface;
   a second horizontally disposed graphite boat having a substantially flat lower surface, a substantially flat upper surface having at least one depression therein and rims at each end of said second boat projecting a substantially identical pre-determined distance vertically above said upper surface thereof;
said second boat being stacked upon said first boat such that the lower surface of said second boat is in contact with the projecting rims of said first boat and defines an open longitudinal recess with the upper surface of said first boat for receiving Ga, at least one GaAs substrate wafer and Si on the surface of said wafer.

4,287,849

APPARATUS FOR COATING CERAMIC TILES OR THE LIKE TO BE ADVANCED TO ROLLER TUNNEL KILNS

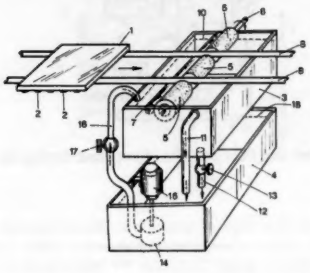
Ulrico Walchhuetter, Via Accademia 39, Milan, Italy

Division of Ser. No. 16,895, Mar. 2, 1979. This application Aug. 7, 1979, Ser. No. 64,624

Claims priority, application Italy, Mar. 24, 1978, 21580 A/78

Int. Cl.[3] B05C *1/02*

U.S. Cl. 118—602 4 Claims



1. An apparatus for protecting ceramic tiles or the like to be advanced to roller tunnel kilns utilized for firing the ceramic tiles, comprising conveying means for advancing the tiles to be treated in a direction towards the kiln; a plurality of rotary rollers coaxially mounted to one another with a common axis extending in a direction transversal to the advancing direction; a first tank containing the refractory material suspension; a second tank containing the refractory material suspension and located below said first tank and in communication therewith; and means for circulating the refractory material suspension between said first and second tanks for maintaining constant and uniform density of the suspension, said rollers being partially extended into said first tank and adapted to contact the underside of the tiles for applying a protective layer of a refractory material in suspension only to the underside of the tiles when the latter pass said rollers in the advancing movement whereby said rollers absorb the material suspension and apply a protective layer to at least part of the underside of the tiles prior to entry of the same into the kiln.

4,287,850

MAGNETIC BRUSH DEVELOPING APPARATUS

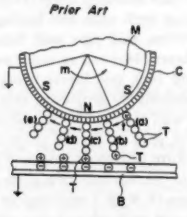
Toshio Yamamoto, and Shizuo Yuge, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1978, Ser. No. 884,184

Claims priority, application Japan, Mar. 22, 1977, 52-31719

Int. Cl.[3] G03G *15/09*

U.S. Cl. 118—657 18 Claims



1. A magnetic brush developing apparatus for use in a toner powder image transfer type electrophotographic copying machine, which comprises: a photosensitive member; a single outer cylinder fixedly disposed in spaced opposed relation to said photosensitive member; a magnet member rotatably accommodated in said outer cylinder for being rotatably driven; a toner container containing therein a mono-component developer composed of magnetically attractive toner particles and disposed adjacent said outer cylinder for supplying the toner particles onto said outer cylinder; a developing electrode plate on said outer cylinder and in spaced opposed relationship to the surface of said photosensitive member approximately equidistantly spaced from said photosensitive member and located upstream of the position at which the surface of said outer cylinder is closest to the surface of said photosensitive member an excessive developing region for causing the toner particles to be magnetically formed into a brush for transferring toner particles to said photosensitive member for developing the image portion of an electrostatic latent image formed on said photosensitive member with sufficient density; toner particle guide means extending from said outer cylinder to the upstream end of said developing electrode plate for guiding toner particles from said outer cylinder to the upstream end of said developing electrode plate; means connected to said apparatus in said excessive developing region for giving to said developing electrode plate a charge ranging from a charge equal to that of the reverse surface of the photosensitive member to a charge which biases said developing electrode plate with an opposite polarity to the polarity of said latent image, said outer cylinder and said photosensitive member downstream of said excessive developing region defining therebetween a toner removing region for removing toner particles adhering at least to the non-image portions of the electrostatic latent image, said magnet member in said outer cylinder being closer to said photosensitive member in said toner removing region than in said excessive developing region for exerting a substantially stronger magnetic force on toner particles in said toner removing region than in said excessive developing region; and further means connected to said apparatus in said toner removing region for giving to said apparatus on the side of said toner removing region on which said outer cylinder is positioned a charge ranging from a charge equal to that of said photosensitive member to a charge which biases said side of the toner removing region with the same polarity of said latent image.

4,287,851

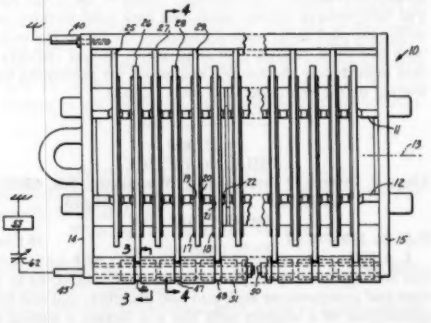
MOUNTING AND EXCITATION SYSTEM FOR REACTION IN THE PLASMA STATE

Alfred R. Dozier, 9332 Portsmouth Dr., Huntington Beach, Calif. 92646

Filed Jan. 16, 1980, Ser. No. 112,786

Int. Cl.[3] C23C *13/08*

U.S. Cl. 118—723 9 Claims



1. Apparatus for supporting a plurality of wafer-like substrates so as to be treatable in a plasma environment, comprising:

at least three plate-like electrically conductive electrodes each having a face parallel to and spaced from one another along an axis;

support means adjacent to each of said electrodes for supporting a wafer-like substrate against at least one of said faces between each pair of adjacent electrodes;

a first conductive bus conductively connected to a first set of alternate ones of said electrodes;

a second conductive bus; and

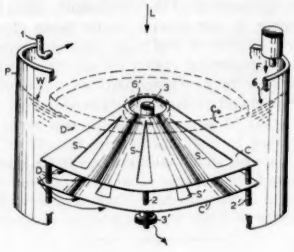
an individual capacitative coupling respective to each member of a second set of said electrodes, said second set of electrodes comprising the electrodes located between the electrodes of said first set, each said capacitative coupling being connected to its respective electrode and to said second bus but not directly to any other capacitative coupling, whereby in a circuit including said first and second buses, each pair of adjacent electrodes and the respective capacitative coupling are in series relationship, and the respective members of said pairs are in parallel connection with one another.

4,287,852

FISH GROWTH ACCELERATION AND DENSITY-INCREASING APPARATUS AND METHOD

Robert H. Rines, 13 Spaulding St., Concord, N.H. 03301, and Albert Knowles, Westbrook, Moniack Bridge by Kirkhill, Scotland

Filed Oct. 11, 1979, Ser. No. 83,571
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—3 **49 Claims**



1. Apparatus for accelerating the growth of fish, including salmonoids and the like, within a pool of water containing the fish, comprising light-opaque cover means provided with means supporting the same submerged within the pool; the cover means having a plurality of open regions spaced along its surface intermediate light-opaque regions of the cover means; said light-opaque regions producing dark light-shielded zones within the pool underneath the same for the fish to rest in quiet, with said open regions providing access to and visibility for feed immediately thereunder; and means for promoting visual feeding by the fish under said open regions.

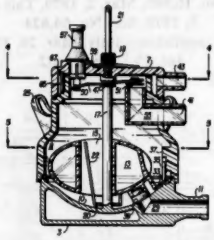
4,287,853

MILKING DEVICE

Lloyd P. Duncan, 3 Riverbend Pl., Washington, Mo. 63090

Filed Mar. 24, 1980, Ser. No. 133,313
Int. Cl.³ A01J *5/04*
U.S. Cl. 119—14.55 **15 Claims**

1. A milker comprising a walled chamber with a lower milk exit and upper entry nipples adapted to be connected to teat cups and communicate milk into said chamber, said exit being connectible to a vacuum milk line and having a valved seat adjacent the bottom of said chamber, said chamber having vacuum inlet means that maintains an operating vacuum therein, a float valve on said seat and said valve being pivoted to the milker to rise and expose the exit responsive to the level of milk in said chamber, said valve having curved sides, said nipples extending upwardly from leads into the chamber side wall adjacent the float, and positioned to direct at least a substantial portion of the milk inflow downwardly to below the upper surface of the float tangentially with respect to said



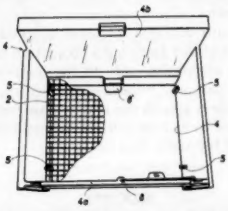
sides, whereby said float can rise unimpeded during the inflow of milk.

4,287,854

CAGE CONSTRUCTION FOR USE IN BREEDING FUR-BEARING ANIMALS

Finn Hansen, Risskov, Denmark, and Bernhard Lodder, Hardenberg, Netherlands, assignors to Wavin B.V., Em Zwolle, Netherlands

Filed Feb. 11, 1980, Ser. No. 120,543
Claims priority, application Denmark, Feb. 12, 1979, 573/79
Int. Cl.³ A01K *1/02, 1/03*
U.S. Cl. 119—17 **12 Claims**



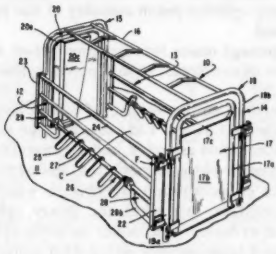
1. A cage construction for use in breeding fur-bearing animals, such as mink, and comprising a plurality of cages arranged on a stand, whereby each cage is provided with a breeding coop with an opening giving access to the cage, characterized in that each breeding coop (**4**) comprises a vertical plastic pipe open at both ends and having a substantially rectangular cross section, said pipe wall being formed by a central foam plastic layer (**14***a*) and an outer and an inner solid surface layer (**14***b* and **14***c*), said layers being integrally connected, molded projections (**5**) projecting into the pipe on the inner side of the pipe wall at a predetermined distance from the lower edge (**4'**) of the pipe wall, said projections optionally being present in the form of corner ledges (**5'**) for supporting an inner coop insert (**3**) in the form of a grate, at least one set of auxiliary projections (**8**, **8'**, **8''**) provided at the lower edge (**4'**) of said pipe wall, said projections being adapted to pivotably mount perforated bottom wall (**10**) such as a second grate closing the plastic pipe, a part of said pipe wall forming the rear wall (**4***b*) of the breeding coop (**4**) being extended a short distance above the remaining portion of the pipe and provided with molded means (**15**) opposing the interior of the pipe, for locking the coop insert (**3**) in the pipe.

4,287,855

FARROWING PEN

Robert J. Gibson, R.R. #1, Brook, Ind. 47922

Filed Jan. 31, 1980, Ser. No. 117,057
Int. Cl.[3] A01K *1/02*
U.S. Cl. 119—20 10 Claims



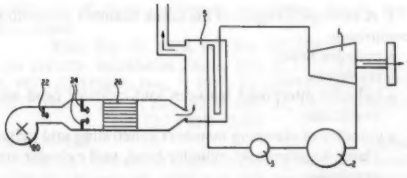
1. A farrowing pen comprising upright side walls, and upright end walls connected thereto and coacting therewith to form a compartment for accommodating a sow during and after farrowing; at least one side wall having a lower peripheral portion elevated relative to a surface for supporting the accommodated sow and coacting therewith to form an elongated opening for access to a nursing space, and an adjustable assembly carried by said one sidewall and adjacent said lower peripheral portion, said assembly including an elongated center section adjustable about its longitudinal axis and having a plurality of longitudinally spaced elements protruding outwardly therefrom and adjustable as a unit with said center section, relatively stationary end sections supportingly engaging opposite ends of said center sections, and complemental means mounted on said center and end sections for retaining said center section in a predetermined position of adjustment.

4,287,856

ENGINES

Bernard E. Enga, Maidenhead, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed May 4, 1979, Ser. No. 35,826
Claims priority, application United Kingdom, May 8, 1978, 18240/78
Int. Cl.[3] B09B *3/00*
U.S. Cl. 122—4 D 9 Claims



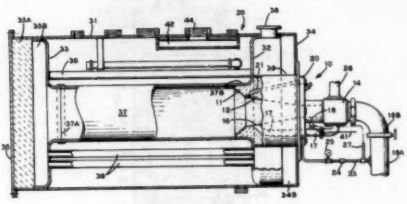
1. A Rankine cycle engine including a boiler unit comprising a catalytic combustor; a fan for producing a stream of air to said combustor wherein the temperature of the air is between 0° and 600° C. and the pressure is between 1 and 20 atmospheres; a pilot burner; and fuel injector means for fueling said pilot burner and further means for injecting the remaining fuel into the stream of air; said catalytic combustor comprising a temperature stable oxidation resistant monolith, the monolith providing catalytic channels for contact with and passage of the air combined with injected fuel such that catalytic combustion of the fuel takes place therein but with a pressure drop of 10% or less, and means for transferring heat from the stream of hot gaseous fluid to the working fluid of the Rankine cycle engine, the monolith comprising at least one of the metals Ru, Rh, Pd, Ir and Pt, a base metal, a base metal alloy or a base metal alloy containing at least one platinum group metal.

4,287,857

BURNER-BOILER COMBINATION AND AN IMPROVED BURNER CONSTRUCTION THEREFOR

Leo Schnitzer, 22 Burr Farms Rd., Westport, Conn. 06880

Filed Sep. 11, 1979, Ser. No. 74,494
Int. Cl.[3] F22B *31/00*
U.S. Cl. 122—23 20 Claims



1. A burner for burning a gasifiable liquid fuel comprising
a burner nozzle having an inlet and an outlet,
a mixing chamber connected in communication with said inlet;
means for introducing combustion air into said mixing chamber under pressure whereby the velocity of the combustion air through said mixing chamber creates a zone of reduced pressure in said mixing chamber,
said nozzle having a gas return port adjacent to the outlet of said nozzle, and
a return tube interconnected between said gas return port and said mixing chamber whereby the zone of reduced pressure in said mixing chamber induces a flow of hot combustion gas through said gas return port and connected return tube to said mixing chamber,
means for introducing a liquid fuel into said return tube whereby the hot gases of combustion effect the gasification of the liquid fuel prior to said fuel entering into said mixing chamber to mix with said air to form a combustible gaseous mixture;
ignition means disposed relative to said nozzle to effect ignition of said combustible gaseous mixture, whereby a flame having a high flame velocity and very high flame temperature is achieved so as to cause a break down in a portion of the hydrocarbons into their basic elements hydrogen and carbon, and a means disposed adjacent to the outlet of said burner nozzle for directing an air stream in a generally tangential direction relative to the longitudinal axis of said nozzle and burner flame therein whereby said air stream effects the diffusion burning of the free hydrogen and carbon and the maintaining of said velocity.

4,287,858

INTERNAL COMBUSTION ENGINE

Luigi Anzalone, Rochester, N.Y., assignor to Vincenzo Pasquarella, Rochester, N.Y.

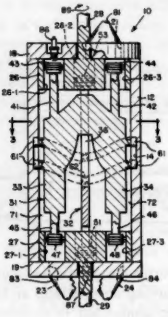
Filed Sep. 21, 1979, Ser. No. 66,072
Int. Cl.[3] F02B *57/00*
U.S. Cl. 123—43 AA 9 Claims

1. An engine, comprising
a housing having a cylindrical bore, a pair of axially-spaced, circular cylinder plates mounted to rotate in opposite ends of said housing bore coaxially thereof,
each of said cylinder plates having therein at least one axially-extending piston bore opening at its inner end on said housing bore,
at least one piston member extending transversely across the center of said housing bore in the axial space between said

cylinder plates, and mounted for axial reciprocation in said bore and for rotation with said plates,

at least one piston carried on each end of said member for reciprocation in the piston bore in the adjacent cylinder plate,

means for conveying combustible fuel to, and for conveying exhaust gases from, the outer ends of said piston bores, whereby cyclical combustion of said fuel in said piston bores imparts reciprocation to said piston member,



means interposed between said housing and said member and operative to impart rotation to said member and said plates during reciprocation of said member in said housing, and

a shaft connected to at least one of said plates for rotation therewith in axially spaced relation to said piston member, and projecting from said one plate to the exterior of said housing coaxially thereof.

4,287,859

TWO-STROKE CYCLE GASOLINE ENGINE

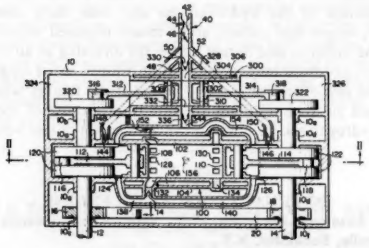
Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, and Isao Igarashi, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 20, 1978, Ser. No. 917,244

Claims priority, application Japan, Apr. 28, 1978, 53-52104

Int. Cl.³ F02B *1/08*

U.S. Cl. 123—51 BA **7 Claims**



1. A two-stroke cycle gasoline engine, comprising:

(a) at least one two-stroke cycle power cylinder-piston assembly incorporating uniflow scavenging and two horizontally opposed pistons;

(b) a pair of crankcases and crank mechanisms housed in said crankcases operatively associated with said power cylinder-piston assembly;

(c) a scavenging pump means including:

(1) at least one pump cylinder-piston assembly of the reciprocating type driven by said power cylinder-piston assembly in synchronization therewith; and

(2) reciprocating piston pump structures including said crankcases and crank mechanisms;

(d) a carburetor;

(e) first passage means for supplying fuel-air mixture from said carburetor individually to said pump cylinder-piston assembly and to said pair of crankcases;

(f) second passage means for supplying fuel-air mixture from said pump cylinder-piston assembly to said pair of crankcases; and

(g) third passage means for supplying fuel-air mixture from said pair of crankcases to said power cylinder-piston assembly,

wherein the total stroke volume of said scavenging pump means is between 1.35 and 1.85 times as large as that of said power cylinder-piston assembly, and the operational phase of said pump cylinder-piston assembly is so shifted relative to that of the power cylinder-piston assembly to which it supplies scavenging mixture, that when the power cylinder piston assembly is at its bottom dead center the pump cylinder-piston assembly is in a range between its top dead center and a phase point which is slightly before the top dead center.

4,287,860

TWO-CYCLE ENGINE

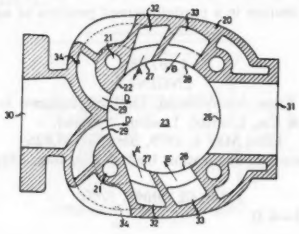
Tetsuzo Fujikawa, Kobe; Toshiyuki Takada, Miki, and Kichiji Misawa, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 24, 1980, Ser. No. 133,373

Claims priority, application Japan, Mar. 28, 1979, 54-40813

Int. Cl.³ F02B *33/04*

U.S. Cl. 123—73 PP **4 Claims**



1. A two-cycle engine of the crank chamber preloading type comprising:

a cylinder head;

a crankcase;

a cylinder interposed between said cylinder head and said crankcase;

a plurality of clamping members penetrating said cylinder to clamp together said cylinder head, said cylinder and said crankcase;

a piston arranged in said cylinder for sliding reciprocating movement;

a suction port and an exhaust port formed in the wall of said cylinder;

at least one main scavenging port formed in the wall of said cylinder and communicating with a crank chamber in said crankcase via a main scavenging passage; and

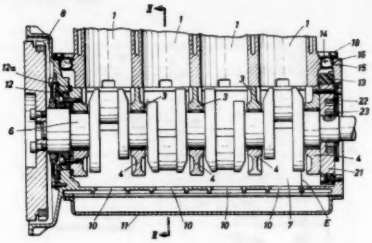
at least on ancillary scavenging port formed in the wall of said cylinder and communicating with said crank chamber via an ancillary scavenging passage; wherein the improvement resides in that said ancillary scavenging port extends through the wall of said cylinder in a manner to surround the outside of one of said clamping member receiving openings.

4,287,861

RECIPROCATING INTERNAL-COMBUSTION ENGINE

Kurt Lettner; Eugen Egger, and Rudolf Unger, all of Steyr, Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Mar. 9, 1979, Ser. No. 19,323
Int. Cl.³ F02B 77/13
U.S. Cl. 123—198 E **9 Claims**



1. An internal combustion engine comprising
(a) a power unit including a plurality of cylinders and associated cylinder heads, crankshaft bearings connected to the cylinders and a crankshaft rotatably mounted in the bearings, the crankshaft having two ends,
(b) an outer pan having a bottom and an upper rim, the outer pan carrying the power unit and the power unit being mounted in the outer pan with a portion of the power unit protruding above the upper rim of outer pan, the protruding power unit portion and the upper rim defining a space therebetween,
(c) a flywheel housing connected to the outer pan beyond one of the crankshaft ends,
(d) annular soundproofing, load-bearing supporting members mounted coaxially about the crankshaft bearings near the ends of the crankshaft, the supporting members being arranged to support and center the power unit with respect to the outer pan and to hold the power unit against substantial axial movement in the outer pan, and
(e) an oil seal mounted in the space between the protruding power unit portion and the outer pan upper rim for sealing in an oil-tight manner the power unit in the outer pan.

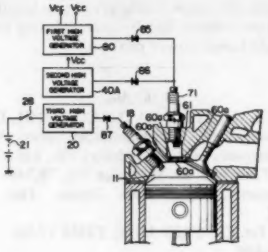
4,287,862

OTTO-CYCLE INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Taro Tanaka, Chiryu, and Yoji Kato, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 29, 1978, Ser. No. 947,703
Claims priority, application Japan, Oct. 3, 1977, 52-118807; Oct. 5, 1977, 52-119861; Dec. 2, 1977, 52-145552; Dec. 5, 1977, 52-145872; Dec. 19, 1977, 52-153279; Dec. 22, 1977, 52-155337
Int. Cl.³ F02P 15/02
U.S. Cl. 123—310 **7 Claims**

1. An internal combustion engine including a cylinder head, a cylinder block coupled with said cylinder head, a piston housed in said cylinder block to define a combustion chamber therein with said cylinder head, an intake port for introducing an air-fuel mixture into said combustion chamber during a suction stroke of the engine, an exhaust port for exhausting a residual gas, and an intake valve positioned at said intake port to open and close the same, comprising:
a first spark plug mounted in said cylinder head to expose its electrodes to said combustion chamber; and
a first spark discharge control circuit coupled with said spark plug for starting a spark discharge at said spark plug at a predetermined time during the suction stroke and for continuing said spark discharge during at least a first half of a compression stroke,
thereby producing radicals by modifying said air-fuel mixture around said electrodes so that the entire air-fuel mixture introduced into said combustion chamber can be readily and completely burnt, and
wherein said cylinder head is provided with a radical producing chamber communicated with said combustion chamber, and said spark plug is so mounted as to expose its electrodes into said radical producing chamber thereby to retain said radicals in said radical producing chamber, and



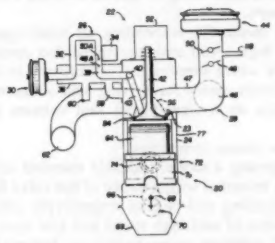
wherein said radical producing chamber is provided with a flame arrester through which said radical producing chamber communicates with said combustion chamber, whereby the flame which may be caused by said spark discharge started during the suction stroke is effectively extinguished by said flame arrester.

4,287,863

POWER TRANSMISSION

John T. Rauen, 6190 Lodewyck, Detroit, Mich. 48224

Continuation-in-part of Ser. No. 539,661, Jan. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 313,144, Dec. 7, 1972, Pat. No. 3,859,971. This application Jan. 11, 1979, Ser. No. 2,624
Int. Cl.³ F02B 5/00
U.S. Cl. 123—432 **17 Claims**



1. A method of reducing the exhaust emissions of an internal combustion engine having a dual induction system, said dual induction system including a cold air intake and a heated fuel-air intake, a plurality of cylinders, each having a reciprocating piston, and an exhaust outlet means, a crankshaft, said engine including connecting rods interconnecting said pistons and said crankshaft, said method including the steps of:
(a) supplying a heated fuel-air gaseous mixture through said heated fuel-air intake into a cylinder during the intake stroke of a piston reciprocating therein;
(b) simultaneously with step (a) supplying cold intake air through said cold-air intake into said cylinder whereby the overall fuel content in the cylinder remains at approximately 4.8% of the total air volume inducted and thereby increasing the breathing capacity of said engine, said mixture being concentrated at said cylinder's spark plug, by said dual induction system, to assure consistent ignition

of said mixture whereby unburned hydrocarbon emissions, carbon monoxide gas and nitrogen oxide gas are reduced;

(c) guiding said reciprocating pistons within said cylinders by means of a crosshead assembly and guideways guiding said crossheads in the reciprocating axis of said pistons, to eliminate from said pistons the thrust force of said connecting rods and permit the pistons to float within the cylinders; and

(d) increasing the piston sliding speed to a speed in excess of 3000 feet per minute thereby compensating for the power loss to said lower power mixture.

4,287,864

AIR-FUEL MIXTURE RATIO CONTROL DEVICE

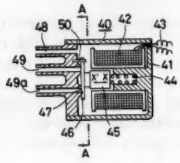
Shigetaka Takada, Ohbu, and Kazumichi Naruse, Nagoya, both of Japan, assignors to Aisan Industry Co., Ltd., Aichi, Japan

Filed Sep. 25, 1979, Ser. No. 78,744

Claims priority, application Japan, Oct. 9, 1978, 53/138740[U]

Int. Cl.³ F02B *33/00*; F22M *17/00*

U.S. Cl. 123—440 **6 Claims**



1. An air-fuel mixture ratio control device for controlling air-fuel mixture ratio in a carburetor which supplies a fuel mixture to an engine and has high speed and low speed systems with air bleed intake ports, comprising

a feed-back loop including an exhaust gas sensor means for detecting the air-fuel ratio of the fuel mixture,

the air bleed intake ports of said high speed and low speed fuel systems each being projected forming two air bleed control ports,

an actuator means for controlling air bleed quantities for both the high speed and low speed fuel systems in the carburetor which supplies the fuel mixture to the engine,

a control circuit means for driving said actuator means in dependency on a signal from said exhaust gas sensor means,

said actuator means comprising,

means comprising a single, rotatable solenoid valve axially moveably mounted with a stroke of the valve for simultaneously opening and closing respectively said air bleed control ports of said high speed and low speed fuel systems, said solenoid valve having an armature, a plate-shaped valve member mounted on said armature and a valve seat portion, said air bleed control ports extending in said valve seat portion,

a pin means projecting from said valve seat portion operatively engages said plate-shaped valve member over the stroke of said valve, for preventing rotation of said valve member,

said plate-shaped valve member is substantially rectangular, is centrally connected to said armature and is formed with a U-shaped groove in one narrow edge of said plate-shaped valve member,

said pin has a free end remote from said valve seat portion and a length from said free end to said valve seat portion slightly greater than the stroke of said valve,

said pin freely extends into said U-shaped groove from one side and said free end extends beyond the other side of said valve member in at least a postion of the latter against said valve seat portion.

4,287,865

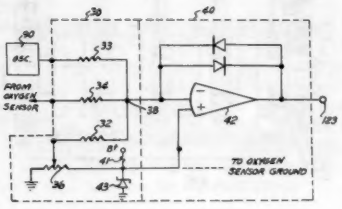
CLOSED LOOP ENGINE CONTROL SYSTEM

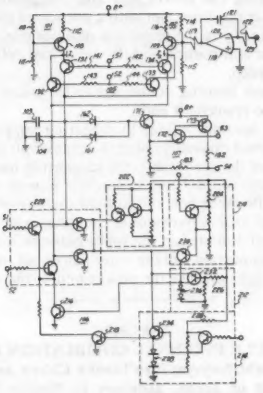
William R. Seitz, Farmington, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 18, 1972, Ser. No. 290,188

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—489 **19 Claims**





1. A control system for an internal combustion engine said control system comprising:

an internal combustion engine;

sensor means for examining an engine operating variable, operative to generate an output signal having a variable characteristic selected to be indicative of the quality of the combustion process occurring within the engine;

signal generating means operative to generate an oscillatory signal having a frequency varying with engine RPM;

signalling means responsive to combine the sensor means signal and the oscillatory signal and to generate a further output signal, at least a portion of which has a repetition rate controlled by said frequency of said oscillatory signal and at least a portion of which has a signal characteristic dependant on said variable characteristic which is indicative of combustion process quality deviations from a predetermined quality;

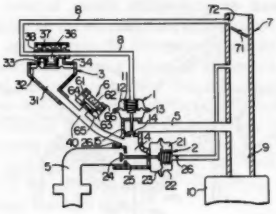
fuel delivery controller means receiving said further output signal and operative to modulate each increment of fuel delivery at all engine speeds in response to both the repetition rate and characteristic of said further output signal.

4,287,866

EXHAUST GAS RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yasuhiro Ikuta, and Masashi Matsuo, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 11, 1979, Ser. No. 74,764
Claims priority, application Japan, Jul. 31, 1979, 54-98492
Int. Cl.[3] F02M *25/06*
U.S. Cl. 123—568 6 Claims



1. An exhaust gas recirculation system for an internal combustion engine comprising:

an exhaust gas recirculation passage,

a constant pressure chamber defined in said exhaust gas recirculation passage,

a pressure regulating valve communicating with said control pressure chamber through a pressure transmitting passage operative in response to the exhaust gas pressure in said constant pressure chamber,

a first flow-rate control valve responsive to vacuum regulated by said pressure regulating valve for opening and closing said exhaust gas recirculation passage,

a second flow-rate control valve disposed at the upstream side of said constant pressure chamber for changing the cross-sectional area of said exhaust recirculation passage in response to the vacuum generated by said engine, and

an atmospheric-pressure introduction valve for introducing atmospheric pressure into said pressure transmitting passage in accordance with the increase of the level of vacuum in at least one of said constant pressure chambers and said pressure transmitting passage.

4,287,867

COMPOUND BOW

John J. Islas, Canastota, N.Y., assignor to Victor United, Inc., Chicago, Ill.

Filed Feb. 25, 1980, Ser. No. 124,473
Int. Cl.[3] F41B *5/00*
U.S. Cl. 124—24 R 10 Claims

1. An archery bow including

a riser having a front face arranged to be directed at a target and a belly facing the archer, said riser further having spaced-apart top and bottom ends,

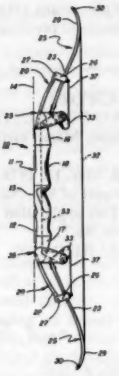
a pair of outwardly extended spring members cantilevered from the top and bottom ends of the riser,

upper and lower elongated limbs each having a midsection, an outer tip and an inner base, each limb being rotatably connected by pivot means to the free end of one of the extended spring members with the limb being positioned on the belly side of said spring member,

a pair of movable cams rotatably supported from the top and bottom ends of the riser adjacent to the base of the upper and lower limbs,

cable means trained over each of said cams for movement therewith, each of said cable means being secured at one end to the base of an adjacent limb and at the other end to the midsection of said adjacent limb, and

a bow string being connected to the tip of each limb whereby drawing the bow string from its rest position



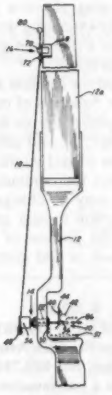
toward a fully drawn position causes the cams to rotate and thus impart a programed motion to said limbs.

4,287,868

RETRACTING ARROW REST

Charles M. Schiff, 976 S. Rifle, Aurora, Colo. 80012

Filed Jun. 16, 1980, Ser. No. 159,877
Int. Cl.[3] F41B *5/00*
U.S. Cl. 124—41 A 9 Claims



1. An arrow rest device movable from an arrow supporting position to a position to clear fletching on an arrow released from a bow, comprising:

(a) an arrow holder assembly adapted to be mounted on a bow said assembly including an arrow rest

(b) positioning means connected to said arrow holder assembly for positioning said arrow rest from upright arrow holding, position when the bow is not drawn, to a lowered, arrow clearing, position when a drawn bow string is released

(c) triggering means adapted to be attached to an end portion of a limb of a bow, responsive to movement of a bow limb after arrow release, for moving said arrow holder assembly from said upright position to said lowered position in response to said movement of a bow limb, inclusive of a shaft adapted to be mounted on said end portion of a bow limb and a pivotal arm extending radially from said shaft and pivotable relative to a bow, weight means associ-

ated with said pivotal arm and movable in response to movement of a bow limb and cable means interconnecting said arrow holding assembly and pivotal arm whereby movement of said weight means pivots said pivotal arm pulling on said cable means to pivot said arrow rest to said lowered position.

4,287,869

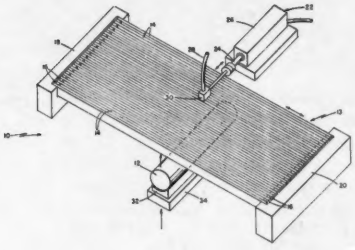
CHARGING SYSTEM FOR CUTTING BLADE

Frederick Schmid, Marblehead, Mass., assignor to Crystal Systems Inc., Salem, Mass.

Division of Ser. No. 886,036, Mar. 13, 1978, Pat. No. 4,187,828, which is a continuation-in-part of Ser. No. 767,809, Feb. 11, 1977, Pat. No. 4,092,972. This application Jun. 15, 1979, Ser. No. 48,712

Int. Cl.[3] **B28D** *1/06*

U.S. Cl. 125—16 R **14 Claims**



1. A system for charging abrasive particles into a blade including a longitudinally-extending abrasive-holding portion as said blade is moved in a direction generally parallel to its length, said system comprising:

a charging roll mounted for rotation about an axis generally perpendicular to the direction of movement of said blade and including an annular groove having a width slightly greater than the width of said abrasive-holding portion and less than the sum of said width of said abrasive holding portion plus twice the nominal size of said particles, whereby said blade may be charged by positioning said abrasive-holding portion in said groove and embedding said particles into the portion of said abrasive-holding portion facing the base of said groove.

4,287,870

INDOOR BARBEQUE COOKING DEVICE

John Johnson, 3695 Hunter St., Glen Avon Heights, Calif. 92509

Continuation-in-part of Ser. No. 889,754, Mar. 24, 1978, Pat. No. 4,185,611, which is a continuation-in-part of Ser. No. 713,888, Aug. 12, 1976, Pat. No. 4,088,144. This application Apr. 9, 1979, Ser. No. 28,058

Int. Cl.[3] **A47J** *37/00;* **F24B** *7/00;* **F23H** *13/00*

U.S. Cl. 126—25 C **10 Claims**

1. A cook device comprising

means for holding fuel;

means for holding food to be cooked;

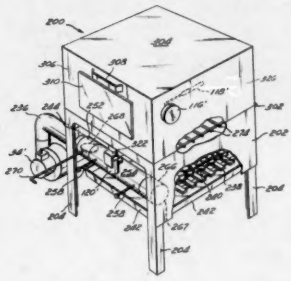
means for selectively enclosing said food-holding means to provide an oven;

means for blowing air;

air jet means, in air flow communication with said air-blowing means (for) selectively moveable between a first position directing a jet of air toward the fuel in said fuel holding means (or) and a second position directing air into said oven;

light-sensing means for activating said air blowing means in response to the detecting of an open flame in said fuel-holding means so that said flame is extinguished by a jet of air from said air jet means when said air jet means is directed toward the fuel in said air jet means, thereby preventing the charring of said food, and

heat-sensitive means for activating said air blowing means in response to the presence of a temperature in said oven which is greater than a selected temperature so that said oven is cooled to approximately said selected temperature by a flow of air from said air jet means when said air jet means is directed toward said oven;



wherein said air jet means comprises:

a tubular member rotatable about its longitudinal axis; and

a nozzle in said tubular member,

said food holding means is a grill, said fuel holding means is a grate, and said air jet means further is selectively rotatable to a third position directing said nozzle toward said grate.

4,287,871

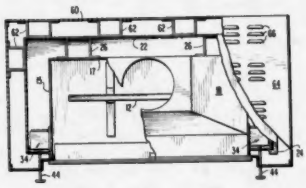
ZERO CLEARANCE MOBILE HOME FIREPLACE UNIT

George Schumann, Vanderhoof, Canada, and Jerry Beckstead, Glenrock, Wyo., assignors to Energy Research International, Nassau, The Bahamas

Filed Oct. 23, 1978, Ser. No. 953,759

Int. Cl.[3] **F24B** *3/00;* **F24C** *1/14;* **F24B** *7/00*

U.S. Cl. 126—67 **7 Claims**



1. An isolated fireplace, space heater for utilizing the heat of combustion of fuel therein to heat the interior of a structure without withdrawing air from the interior of said structure for combustion, comprising:

a firebox having a floor, back, and two sides adapted to be disposed within a structure to be heated; hood means mounted on the upper portion of said firebox for collecting gaseous products of combustion from said box; flue means in communication with said hood means for venting said products to the atmosphere external to the structure;

a first metal skin surrounding the floor, sides, and back of said firebox, and said hood means, said first skin being spaced therefrom to define with said box and hood means a first air passage between the outer surface thereof and the inner surface of said skin; means carried by said device for admitting outside air to said air space and for circulating said air therethrough; vent means carried by said first skin for venting outside air from the passage into the

interior of the structure to be heated whereby when fuel is consumed in said firebox outside air will be circulated therearound and vented into the structure;

door means coupled to the front of said device for enclosing said firebox and said first skin to isolate the interior of said firebox from the interior of the structure;

control means disposed within the air passage for diverting and preheating a portion of the air therein into the firebox to supply combustion air when fuel is consumed therein; said control means comprising at least one housing mounted on the outer surface of said firebox and having an inlet opening into the first passage and an outlet into said firebox; said housing being an elongated, vertically disposed, hollow member and the outlet including a plurality of vertically arrayed apertures disposed adjacent said door means; baffle means disposed between the inlet and the outlet to define a tortuous pathway between the inlet and outlet for air passing into the firebox; and means carried by said housing for controlling the flow of air through the inlet thereto;

insulating means surrounding the outer surface of said first skin for minimizing heat loss therefrom when fuel is consumed in said firebox; and

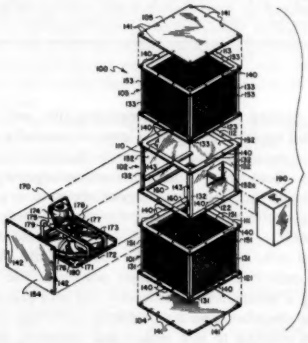
a second skin surrounding the sides, back, floor and upper portion of said first skin and spaced therefrom to define a second air passage; flow means carried by said device for circulating air from within the structure through said second passage.

4,287,872

METHODS AND APPARATUS FOR DUCTLESSLY DISTRIBUTING AND CIRCULATING HEATED AIR FROM A GAS-FIRED HEATER TO HEAT LARGE VOLUMES OF AIR IN INDUSTRIAL FACILITIES

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

Filed Oct. 5, 1979, Ser. No. 82,115
Int. Cl.³ F24H *3/02*
U.S. Cl. 126—110 D **3 Claims**



1. An apparatus for heating, circulating and dispersing air in industrial building facilities and the like, comprising:

(a) an upstanding structure of substantially right parallelepiped configuration including an assambly of lower, intermediate and upper modules arranged one atop the other and secured together to define a substantially unobstructed vertical chamber extending through the assembled modules;

(b) each of the modules having a framework which defines upper and lower mounting flanges extending perimetrically in horizontal planes near upper and lower ends of their associated modules;

(c) the upper and lower mounting flanges of adjacent modules being releasably connected to releasably interconnect the modules;

(d) closure means closing the upper end of the upstanding structure;

(e) each of the modules additionally having four substantially rectangular sidewalls secured to their associated framework, each of the sidewalls of the upper and lower modules having a plurality of apertures formed therethrough to facilitate the passage of air therethrough, and the sidewalls of the intermediate module being substantially imprevious to inhibit the passage of air therethrough with the exception of one of the intermediate module sidewalls having an opening formed therethrough for receiving heated air being discharged from a gas-fired heater;

(f) a heater positioned externally of said one intermediate module sidewall so as to avoid obstruction to said chamber and mounted thereon, said heater having gas-fired means for heating air drawn externally of said modules into said heater from within said industrial facility for discharging heated air through said intermediate sidewall opening into the intermediate module for combining with and augmenting air passing vertically through the chamber; and,

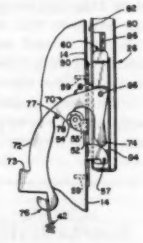
(g) an electrical blower assembly disposed in said vertical chamber at a location between the upper and lower module apertures and including a fan for drawing ambient air through the apertured lower module sidewalls, for ducting such air upwardly through the chamber for combination with heated air being discharged into the chamber by the gas-fired heater, and for discharging such combined air through the apertured upper module sidewalls.

4,287,873

OVEN DOOR HINGE

James R. Goins, Ten Mile, and Hubert H. Cardin, Athens, both of Tenn., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed May 2, 1980, Ser. No. 146,038
Int. Cl.³ F23M *7/00*; E05F *1/12*; A22C *21/00*
U.S. Cl. 126—194 **11 Claims**



1. A hinge mechanism comprising:

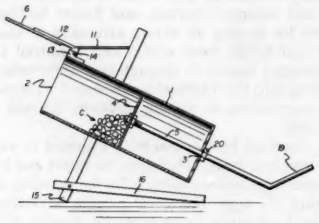
a mounting plate supporting a stop member fixed relative to the mounting plate;

a longitudinally extending hinge link having one end pivotally mounted to and supported by the mounting plate at a location spaced from the position of the mounting plate supported stop member, the hinge link being pivotally movable toward and away from the stop member;

a hinge blade configured as a bell crank pivotally mounted intermediate its ends to the hinge link at a location spaced from said pivotally mounted end, one arm of said hinge blade extending from the hinge link toward the stop member, said one arm being biased toward the stop member and including a recess aligned with the stop member when the hinge mechanism is in at least a partially open position, the other arm of said hinge blade extending generally along at least a portion of the longitudinal extent of the

hinge link, wherein axial alignment of said other arm and the hinge link holds the recess out of engagement with the stop member when the hinge link is moved toward and away from the stop member, a predetermined degree of nonaxial alignment between said other arm and the hinge link permitting engagement of the recess with the stop member to lock the hinge mechanism in place at said partially open position.

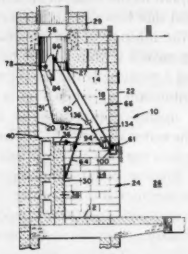
4,287,874
COAL AND ASH CADDY
Edgar E. Michael, Rte. 1, Box 404A, Verona, Va. 24482
Filed Oct. 18, 1979, Ser. No. 86,252
Int. Cl.[3] F23J *1/00*; B65D *88/00*
U.S. Cl. 126—242 **9 Claims**



1. A coal and ash caddy comprising in combination:
a container of uniform cross-section having an open end at one extremity thereof and an aperture at a closed end opposite from said open end,
a plunger plate disposed within said container having a configuration complemental to said uniform cross section of said container,
a plunger rod connected to said plunger plate, said rod extending through said aperture to push the contents within said container outside said open end by coaction of said plunger plate against the contents,
support means pivotally disposed on an outer portion of said container about an axis, said support means having door means overlying said open end, and door-control means operatively connected to said support means whereby when said container is pivoted about said axis relative to said support means said door means opens and closes said open end and said support means simultaneously keeps said container suspended so as to prevent heat from ashes and the like from contacting the surface supporting said caddy.

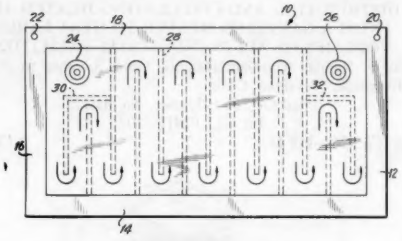
4,287,875
DAMPER SYSTEM
Clell C. Mayes, Box 8, Pigeon Forge, Tenn. 37862
Filed Nov. 23, 1979, Ser. No. 96,983
Int. Cl.[3] F23L *3/00*
U.S. Cl. 126—288 **3 Claims**

1. A damper system in combination with a fireplace including a firebox having a front opening in communication with a room, a lintel, a corner passageway offset from said front opening in communication with said firebox, and below said lintel, an upper opening spaced above said front opening, and a sleeve member extending downwardly from said upper opening toward said front opening to direct combustible product from said fireplace to said upper opening, said damper system comprising weighted plate means pivotally mounted within said sleeve member and biased to an open position, support means connected to said plate means and extending from said plate means through said support means and into said room, means for guiding said elongated flexible means for passage through said corner passageway and through said support means, locking means for selectively securing said flexible means within said support means, whereby said plate means is



selectively pivotable by an operator through said flexible means without penetrating said front opening.

4,287,876
SOLAR HEATING PANEL UNIT AND SYSTEM THEREFOR
Pierre Jacques, Huntington, N.Y., assignor to Cellu-Craft Products Company, New Hyde Park, N.Y.
Filed Nov. 20, 1979, Ser. No. 96,065
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—426 **14 Claims**



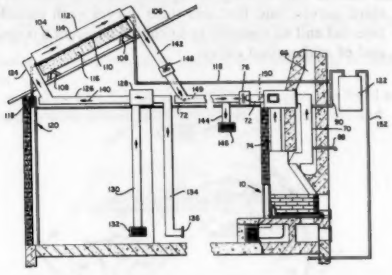
1. A solar heating panel unit comprising first and second sides connected together along an at least substantially endless path to form a pouch having an internal chamber adapted to accommodate a heat transfer fluid, at least one opening being provided through said first and second sides in a position spaced from said chamber to provide for the mounting of said pouch and access means coupled to at least one of said sides for the supply and removal of said fluid to and from said chamber, said first side including a layer of black polyester, said second side including a lamination of reflective foil and plastic, said foil facing said chamber, said access means including inlet and outlet fixtures coupled to said pouch and including engaged members comprising flanges sandwiching one of said sides therebetween, said members defining a bore communicating with said chamber, one of said members extending into said chamber and including therein a cylindrical part spacing said sides apart and provided with radial openings connecting said bore with said chamber, said panel unit further comprising connecting means in said chamber connecting said first and second sides in offset parallel lines to define a serpentine path in the chamber for the flow of said fluid and also connecting said sides in transverse lines proximate said access means to form sub-chambers communicating with said serpentine path to divert the flow of fluid between said access means and said serpentine path.

4,287,877

SOLAR AND CENTRAL FIREPLACE HEATING SYSTEM

Cecil A. Gaines, Rte. 1, Box 120 G, Fort Walton Beach, Fla. 32548

Continuation-in-part of Ser. No. 947,350, Oct. 10, 1978, abandoned. This application Dec. 7, 1979, Ser. No. 101,147
Int. Cl.[3] F24J *3/02*; F28B *7/00*
U.S. Cl. 126—427 4 Claims



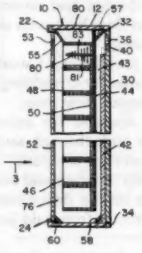
1. A heating system for a building comprising:
a solar panel mounted externally of said building, said solar panel comprising:
a solar radiation absorbing plate;
a solar radiation transmissive plate spaced from said absorbing plate to define a solar air heating chamber therebetween, said solar air heating chamber being sized and shaped to conduct air therethrough and to heat said air passing therethrough during periods when said solar panel is exposed to solar radiation, said solar air heating chmaber having an input and an output;
means for conducting air from inside said building to said input of said solar air heating chamber and for conducting heated air from said output of said solar panel to the inside of said building and for distributing said air to selected portions of said building;
means for forcing air through said conducting and distributing means and through said solar air heating chamber;
water heating means in heat transfer relation with said absorbing plate for conducting water therethrough to heat said water during periods when said solar panel is exposed to solar radiation; said means having an input and an output;
means for conducting water from a pressurized source to said input of said water heating means;
means for conducting water from said output of said water heating means to a storage tank;
a fireplace for burning fuel therein; said fireplace having an opening into a room of said building;
a chimney connected to said fireplace to provide an exhaust for gases of combustion from said fuel burned in said fireplace;
means for selectively providing air from outside said building to said fireplace;
means for selectively sealing said opening of said fireplace from communication with said room;
a heat extraction unit mounted within said fireplace, said unit comprising:
a first air chamber defining a sloping back wall of said fireplace;
a second air chamber defining a sloping upper front wall of said fireplace, such that said sloping back wall and said sloping upper front wall define an opening for passage of said hot gases of combustion from said fireplace to said chimney;
two side air chambers each defining a side wall of said fireplace, said side air chambers freely communicating with said first and second air chamber;
means for conducting air from said building to at least one of said side air chambers, whereby said air in said air chambers is heated by fuel burned in said fireplace;
means for conducting said heated air from said second air chamber to said means for distributing heated air;
means for conducting said heated air from said first air chamber vertically through at least a portion of said chimney, whereby said heated air in said means is further heated by said hot gases of combustion in said chimney, said means further conducting said heated air to said means for distributing heated air; and
means for selectively preventing communication between said means for distributing heated air and said heat extraction unit.

4,287,878

PORTABLE SOLAR HEATER STRUCTURE

Danforth Holley, and Danforth E. Holley, both of Grosse Pointe Shores, Mich., assignors to Holly International Company, Grosse Pointe Farms, Mich.

Filed May 16, 1979, Ser. No. 39,684
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—429 5 Claims



1. Solar heater structure comprising an outer frame having a top, a bottom and two sides defining an exposed elevation and a shade elevation, a back covering the shade elevation of the frame having opening means therein adjacent said top permitting cool air to pass therethrough into the solar heater structure, insulating material within the frame positioned adjacent the back, solar collector means opening toward the exposed elevation of the frame positioned within the frame in spaced relation to said back, said solar collector means being secured to the top of the frame so as to prevent flow of heated air passing over the collector across the top of the collector and out of the back of the frame, being in spaced relation to the bottom of the frame to permit flow of air entering through the back of the frame across the bottom of the collector and upward across the front of the collector, and extending entirely between the sides of the frame, a cover over the exposed side of the frame which is transparent to sun rays in spaced relation to the solar collector means said cover having opening means therein adjacent the top thereof permitting heated air to pass out of the solar heater structure adjacent the top thereof, and a passage in the solar heater structure including the space between the insulating material and the back of the collector, the space between the bottom of the collector and the bottom of the frame and the space between the front of the collector and the cover through which air is drawn from the opening means in the back over the insulating material and past the solar collector means to the opening means in the cover.

4,287,879

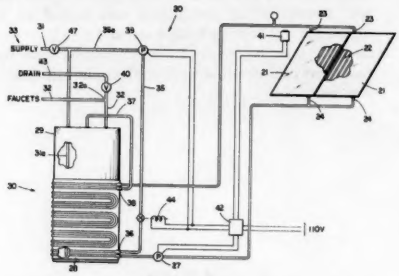
WATER HEATING SYSTEM USING SOLAR ENERGY

Charles F. Roark, 24 Maple La., Brownsburg, Ind. 46112

Division of Ser. No. 810,888, Jun. 28, 1977, abandoned. This application May 3, 1979, Ser. No. 35,463

Int. Cl.³ F24J 3/02

U.S. Cl. 126—437 **22 Claims**



1. A water heating system which comprises:

a solar collector panel having a first passageway cooperating therewith;

a conventional hot water heater assembly having a storage tank therein and a heating device associated with said tank for heating stored water in the tank independent of solar energy;

a heat exchanger jacket having a second passageway and a third passageway therein, said second passageway coupled in a continuous flow loop with said first passageway in said collector panel;

said continuous flow loop having a working fluid therein;

pumping means operable for circulating said working fluid through said continuous flow loop;

fluid transfer means operable for circulating water from within said storage tank through said third passageway and back into said storage tank; and

means circumferentially securing said heat exchanger jacket around said storage tank in direct contact with said tank for heat transfer directly from said jacket by conduction to said tank.

17. A method of converting a water heating system to a solar supplemented heating system comprising the steps of:

taking a conventional water heater assembly having a storage tank with an outer housing and inner insulation, and removing from the tank, the outer housing and insulation to expose the storage tank;

securing to the exposed storage tank, a heat exchanger jacket wrapped around at least the lower half of the tank and circumferentially securing it to the tank;

reinstalling the insulation around the jacket and tank and reinstalling the outer housing around the insulation;

establishing communication of the interior of the tank with one of two serpentine passageways in the jacket to provide a circulation loop for water in the tank through one of the passageways in the jacket and back into the tank; and

providing a solar collector and establishing a circulation loop for working fluid through the solar collector and through another of the serpentine passageways in said jacket.

4,287,880

SOLAR COLLECTOR

John M. Geppert, 3282 S. 77th Ave., Omaha, Nebr. 68124

Filed Nov. 13, 1979, Ser. No. 93,756

Int. Cl.³ F24J 3/02

U.S. Cl. 126—439 **15 Claims**

1. A stationary solar heat collector comprising,

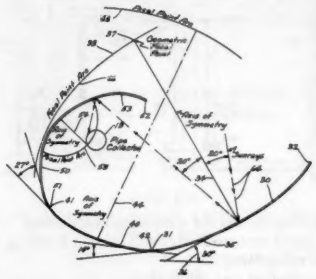
a reflector including a substantially upwardly facing concave reflective surface,

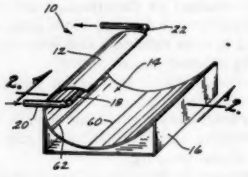
an absorber tube,

means for supporting said absorber tube relative to said reflective surface for receiving reflected sunrays therefrom,

said reflective surface being defined in cross-section by first, second and third semi-parabolic curves arranged in generally end-to-end relation,

said second curve being interposed between said first and third curves, said first and third curves each including a free end and an opposite end situated adjacent a respective end of said second curve,





said first and second curves being disposed in generally upwardly facing relation and said third curve being disposed in generally downwardly facing relation, said absorber tube being positioned below at least an upper portion of said third curve,

said first, second and third semi-parabolic curves each being generally centrally intersected by the respective axis of symmetry therefor,

said first curve being oriented such that the axis of symmetry thereof is inclined upwardly and toward said third curve, and

said second curve being oriented such that the axis of symmetry thereof is inclined upwardly and toward said first curve.

4,287,881

SOLAR ENERGY ABSORBER FOR USE WITH A LINEAR OPTICAL CONCENTRATING SYSTEM

Mario Palazzetti, Avigliana; Angioletta Boero, Turin; Francesca Demichelis, Turin, and Enrica Minetti-Mezzetti, Turin, all of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Feb. 7, 1980, Ser. No. 119,603

Claims priority, application Italy, Feb. 20, 1979, 67372 A/79

Int. Cl.³ F24J 3/02

U.S. Cl. 126—440 **7 Claims**

1. A solar energy absorber for use with an optical system for focusing radiant energy at a focal axis, comprising;

a peripheral wall defining a duct and a longitudinally extending slit for location at said focal axis to allow passage of

said radiant energy focused by said optical system into said duct, said peripheral wall having a reflective internal surface;

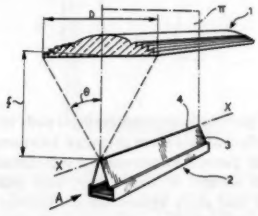
a plurality of parallel, spaced-apart plates extending longitudinally within said duct, arranged to receive directly said radiant energy passing through said slit and adapted to absorb said radiant energy as heat;

a reflective surface extending longitudinally of said duct on the opposite side of said plates from said slit and being arranged to reflect radiant energy incident in a direction parallel to said plates onto said plates; and

said duct having an air-flow therethrough to take up heat from said plates in use of the absorber.

7. Solar energy absorption apparatus comprising, in combination:

an optical system for focusing radiant energy at a focal axis, said optical system having a plane of symmetry; and



a solar energy absorber comprising;

a peripheral wall defining a duct and a longitudinally extending slit at said focal axis to allow passage of said radiant energy focused by said optical system into said duct, said peripheral wall having a reflective internal surface,

a plurality of spaced-apart plates extending longitudinally within said duct parallel to said plane of symmetry of said optical system, said plates being arranged to receive directly said radiant energy passing through said slit and being adapted to absorb said radiant energy as heat;

a reflective surface extending longitudinally of said duct on the opposite side of said plates from said slit and being arranged to reflect radiant energy incident in a direction parallel to said plates; and

said duct having an air-flow therethrough to take up heat from said plates in use of said absorption apparatus.

4,287,882

BLACK LIQUID ABSORBING SOLAR COLLECTOR

John P. Mattson, Ducksberry, Mass., assignor to Solarspan, Inc., Duxbury, Mass.

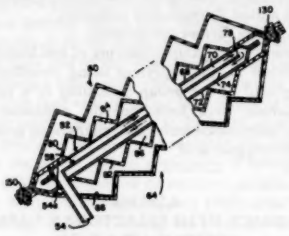
Continuation-in-part of Ser. No. 938,026, Aug. 30, 1978, Pat. No. 4,210,128. This application Jun. 25, 1979, Ser. No. 51,617

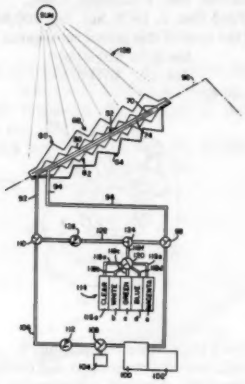
The portion of the term of this patent subsequent to Jul. 1, 1997, has been disclaimed.

Int. Cl.³ F24J *3/02*; F28F *27/02*

U.S. Cl. 126—445 **8 Claims**

7. A solar energy collector comprising an upper and lower cover means wherein at least the upper cover means is transparent to solar radiation, means disposed between said upper and lower cover means for exposing a black liquid absorber to solar radiation to convert solar energy to thermal energy comprising upper and lower conduit means having at least the upper conduit means transparent to solar radiation, said upper and lower conduit means communicating at one end of said black liquid exposing means, inlet and outlet means, disposed at the other end of said black liquid exposing means, said inlet means communicating with said upper conduit means for introducing a black liquid absorber to said black liquid exposing means, said outlet means communicating with said lower conduit means for conveying away said black liquid absorber after exposure to solar radiation, upper and lower wall means disposed within said cover means and about said black liquid exposing means and wherein at least the upper wall means is transparent to solar radiation, said wall means having the configuration and being positioned relative to said black liquid





exposing means whereby when said collector is exposed to solar radiation will provide for mechanical rigidity of said collector and minimize heat loss by conduction, convection and radiation.

4,287,883

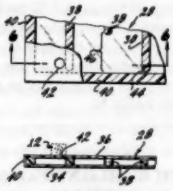
COST-EFFECTIVE SOLAR HEATING SYSTEM

George M. Kyrias, 31112 Via Santo Tomas, San Juan Capistrano, Calif. 92675

Filed May 6, 1980, Ser. No. 147,206

Int. Cl.³ F24J *3/02*; F28F *3/14*

U.S. Cl. 126—445 **10 Claims**



5. A collector of solar heat comprising in combination:

a first panel of a composite material including a sheet of glass cloth included in a cured epoxy resin;

a second panel, parallel to but spaced from said first panel, of a composite material including a sheet of glass cloth included in a cured epoxy resin; and,

a spacer of a cured mixture of silica particles and an epoxy resin, located between and bonded to said first panel and said second panel, and including strips juxtaposed across

the opposing surfaces of said first panel and said second panel, each of said strips being completely surrounded by a space included between said first panel and said second panel whereby said space constitutes a passage for the flow of a fluid through said collector;

said epoxy resin further comprising:

a polymer of the group consisting of epichlorohydrin and bisphenol A, said polymer being crosslinked with a compound of the group consisting of a polyamine, a polyamide, urea formaldehyde, melamine formaldehyde, methylated melamine, methylated urea, or a multibasic organic acid.

4,287,884

KNEE BRACE WITH SELECTIVELY VARIABLY POSITIONABLE PADS

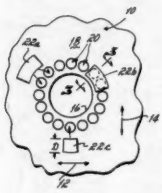
Leslie T. Applegate, Cincinnati, Ohio, assignor to Surgical Appliance Industries, Inc., Cincinnati, Ohio

Filed Dec. 6, 1979, Ser. No. 100,842

The portion of the term of this patent subsequent to May 6, 1997, has been disclaimed.

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 C **2 Claims**



1. An improved knee brace comprising:

a tubular elastic sleeve dimensioned and configured to apply radially inwardly directed compressive forces to the wearer's knee when placed thereabout,

at least four individual pad mounts of substantially identical size permanently fixed to the interior of said sleeve and disposed in a generally circular array surrounding a substantial portion of the wearer's patella, including portions above, below, and on either side of the patella, said mounts being free of direct interconnection therebetween to enable said elastic sleeve to stretch to enlarge the diameter of said circular array when placed on knees of varying girth,

at least a first resilient pad of unit size and at least a second resilient pad of N-unit size where N is an integer larger than one, said pads each selectively removably engageable with different individual pad mounts for selectively removably mounting said pads at different positions relative to the wearer's patella to provide support and protection for the wearer's patella at variable locations thereof as dictated by the individual needs of the wearer, the ratio between the number of pad mounts engaged by said second and first pads being N.

4,287,885

KNEE BRACE WITH RESILIENT PAD SURROUNDING PATELLA

Leslie T. Applegate, Cincinnati, Ohio, assignor to Surgical Appliance Industries, Inc., Cincinnati, Ohio

Filed Dec. 6, 1979, Ser. No. 100,851

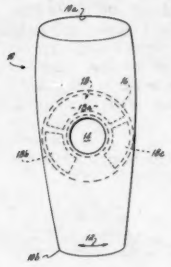
Int. Cl.³ A61F *5/01*

U.S. Cl. 128—80 C **10 Claims**

1. An improved knee brace comprising:

a generally cylindrical sleeve formed of elastic material stretchable in a circumferential direction and dimensioned to cover the leg area at the knee joint, said sleeve having a central front patella section located to be proximate a wearer's patella when said sleeve is positioned about the wearer's knee,

a flexible sheet of material substantially inelastic in a circumferential direction fixedly secured to the interior of said sleeve, said sheet configured and dimensioned to surround a substantial portion of said patella section of said sleeve, and



a plurality of physically separate resilient pads secured to the interior surface of said sheet at spaced locations in a generally circular pattern to surround a substantial portion of said patella section of said sleeve, said pads being restrained by said sheet against circumferential movement relative to said patella section as said sleeve stretches under forces exerted thereon by the knee of a wearer thereof when bent.

4,287,886

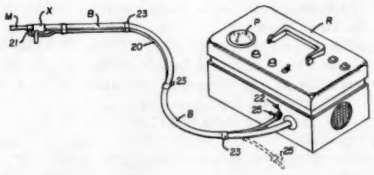
REMOTE PRESSURE SENSOR TUBE FOR THE ALARM SYSTEM OF A RESPIRATOR

Harris A. Thompson, 175 Bellevue Dr., Boulder, Colo. 80302

Filed May 12, 1980, Ser. No. 148,766

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—202.22 **7 Claims**



1. In combination with a respirator having a breathing tube extended therefrom and to a mouthpiece or the like at its remote end and having a pressure-responsive indicator means, including an alarm, to indicate a disruption of the pressures of cyclic respiratory action within a supply passageway in the respirator, the improvement comprising: a sensor means associated with the breathing tube and with the indicator means to initiate a pressure indication at the indicator means responsive to a disruption of pressures of cyclic respiratory action at the remote end of the breathing tube, and selective switch-over means adapted to permit the indicator means to selectively respond to a disruption within the respirator or to a disruption at the remote end of the breathing tube.

4,287,887

OXYGEN RESPIRATOR CONTAINER FOR AN OXYGEN RELEASING CHEMICAL CARTRIDGE

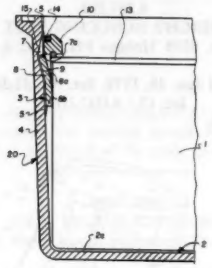
Claus-Dieter Hinz, Lübeck, and Adalbert Pasternack, Bad Schwartau, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 132,999

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913507

Int. Cl.[3] A62B 7/08

U.S. Cl. 128—202.26 7 Claims



1. An oxygen respirator container comprising a cylindrical bottom part having a bottom wall, and an interior side wall with a plurality of spaced apart raised ribs on said side wall defining a recess between adjacent ribs, an oxygen generating cartridge disposed in said bottom part on said bottom wall and over said ribs of said side wall, and at least one holding element disposed in said recess between adjacent ribs between said side wall and said container and having a top head portion projecting outwardly from said holding element towards the center of the bottom part and overlying the top edge of said cartridge and holding said cartridge over said bottom wall, said side wall having an indented part adjacent the top of said container in said recess with a top ledge thereof defining a holding nose, said holding element having a deflectable tab portion engageable under said holding nose.

4,287,888

IRRIGATING APPLIANCE FOR FEMALE HYGIENE

Günter Schwarz, Steinacherstr. 67, 8804 Au, Switzerland

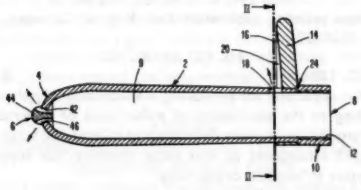
PCT No. PCT/CH79/00039, §371 Date Nov. 13, 1979, §102(e) Date Oct. 19, 1979, PCT Pub. No. WO79/00750, PCT Pub. Date Oct. 4, 1979.

This PCT application filed Mar. 13, 1979, Ser. No. 86,581

Claims priority, application Switzerland, Mar. 13, 1978, 2682/78

Int. Cl.[3] A61M 3/00

U.S. Cl. 128—239 15 Claims



1. In an irrigating appliance for female hygiene with a shaft-like member in which there is a cavity with an inlet (8) and at least one outlet for an irrigating liquid, means for fixing the appliance to one end of a tube connectable to a stationary water supply means located in the vicinity of the rear end of the member and an engagement member arranged in the vicinity of the rear end of the shaft-like member and which projects at least approximately radially from the latter, so that irrigating liquid which flows out when the member is inserted in the woman's vagina is guided over the body surface areas adjacent to the vaginal opening and at least one outlet of the cavity is positioned adjacent to the engagement member side directed towards the front end of the shaft-like member, the improvement comprising a main outlet (18, 34, 34') whose water discharge direction runs radially along one surface of the engagement member positioned adjacent to the latter, an annular duct (68) which embraces the shaft-like member and which is connected with the cavity (70) by a plurality of springs (72), the main outlet (34') being located on an outer periphery point of the annular duct, and a coupling part (102) detachably connected to a ring member (94) and the shaft-like member (90) and having at least one radially directed opening (126) issuing into at least partly annular duct (128) having the main outlet (132) at one point on its periphery.

4,287,889

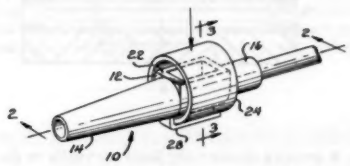
SUCTION CATHETER HAVING A NON-STRESSED VACUUM REGULATOR

James A. Stupar, Waukegan, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 29, 1979, Ser. No. 99,134

Int. Cl.[3] A61M 1/00

U.S. Cl. 128—276 6 Claims



1. A suction catheter, adapted for operation without direct contact by the operator with the secretions being drawn from the patient through the catheter, comprising:

an open ended tube, one end of which is adapted for connection to a vacuum source for the application of a suction force therethrough;

a longitudinal bore extending through the catheter and between its ends;

portions of the catheter defining an opening transverse to the bore and in fluid communicaton therewith; and a flexible band encircling the longitudinal axis of the catheter and overlying the transverse opening in said catheter and spaced therefrom in its unstressed state and having a band portion attached to said catheter the band being made from an inherently resillient material such that it returns to its original conformation after being deformed, the band in said original confirmation being in an unstressed state, the portion of the band adjacent the opening being selectively spaced therefrom, whereby an unintentional closing off of the opening by the band is avoided and residual vacuum is minimized.

4,287,890

ENDARTERECTOMY METHOD

Thomas J. Fogarty, 770 Welch Rd., Palo Alto, Calif. 94304

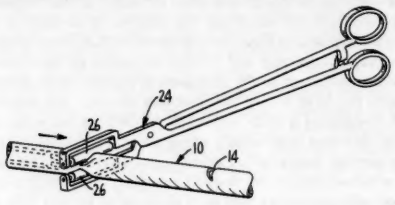
Filed Jan. 24, 1980, Ser. No. 114,980

Int. Cl.[3] A61B 17/00

U.S. Cl. 128—303 R 4 Claims

4. A method for freeing arteriosclerotic occlusions from arteries comprising laterally compressing the artery in a zone of compression to form a tapered end edge on an occ... on

segment, and stripping said occlusion segment from said artery by causing said zone of compression to progressively traverse



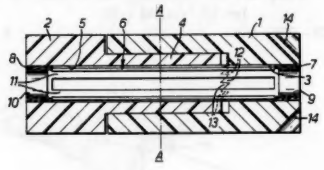
said segment from said tapered end edge to the distal end of said segment.

4,287,891

SECURING DEVICE FOR SURGICAL TUBES

Joseph L. Peters, 282B Ballard La., Finchley, London N.12, England

Filed Aug. 31, 1979, Ser. No. 71,484
Int. Cl.³ A61B *17/34*
U.S. Cl. 128—347 **9 Claims**



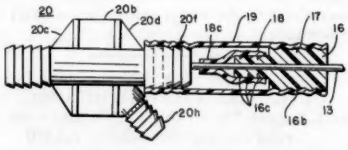
1. A securing device to be fixed externally to the body of a patient fitted with a surgical body tube for securing the body tube against unintentional displacement into or out of the patient, said device comprising tubular means having an axial bore for the body tube to pass through, a flexible elongated gripping element mounted within and extending generally longitudinally of said axial bore means securing said gripping element to said tubular means, and selectively adjustable means for helically winding said gripping element about the axis of said bore and the body tube passing through the bore for urging the element radially whereby to grip the body tube securely, said adjustable means being operable to also unwind said element to release the body tube and allow the latter to be pulled freely through the device.

4,287,892

CANNULA FOR INTRA-AORTIC BALLOON DEVICES AND THE LIKE

Peter Schiff, Box 354 Rte. 7, Cookeville, Tenn. 38501

Filed Mar. 3, 1980, Ser. No. 126,452
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—349 B **29 Claims**



1. A cannula assembly for use with intra-aortic balloons and the like comprising a rigid Y-shaped connector having a first bore extending therethrough and a branching bore communicating with said first bore and extending at an angle thereto; said firstbore having first and second ends; said fitting being providedwith first, second and third coupling projections; said first bore extending through said firstand second couplingprojections and said second bore extending through said third coupling projections; and

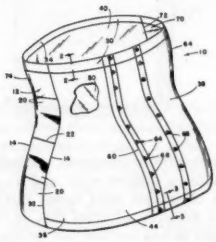
a cannulatube having a first end thereof mounted upon said first coupling projection to form a liquid-tight seal therebetween; the inner diameter of said cannula tube and said first bore being substantially equal.

4,287,893

WEIGHT REDUCING BELT

Maria V. Salazar, 9505 Holmes Plz., Apt. 2, Omaha, Nebr. 68127

Filed Jun. 26, 1979, Ser. No. 52,301
Int. Cl.³ A41C *1/00*
U.S. Cl. 128—556 **8 Claims**



1. A weight reducing belt of a length sufficient to cover a person's midsection, said belt having a vertically extending tightening section made of stretchable resilient material and having the majority of its remaining area formed of flexible material which is substantially impervious to moisture passage therethrough and which is substantially less resilient than said material of said tightening section, means connecting adjacent ends of said remaining area to said tightening section, said remaining area having therein two terminal end portions extending from top to bottom of said belt, means for adjustably connecting said two terminal end portions together so as to give said belt a greater or lesser interior size.

4,287,894

APPARATUS FOR PRODUCING A SERIES OF IMPULSES CORRESPONDING TO A SUCCESSION OF PULSE BEATS

Peter Lautenschläger, Gonbach, and Michael Teichmann, Obermoschel, both of Fed. Rep. of Germany, assignors to Keiper Dynavit GmbH & Co., Fed. Rep. of Germany

Filed Jun. 8, 1979, Ser. No. 46,719
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825327
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—687 **8 Claims**

1. An apparatus for producing a succession of pulses corresponding to the succession of pulse beats of a person, said apparatus having a pulse detector and at least one stage means, arranged subsequent to said pulse detector, for suppressing disruptive influences, comprising:

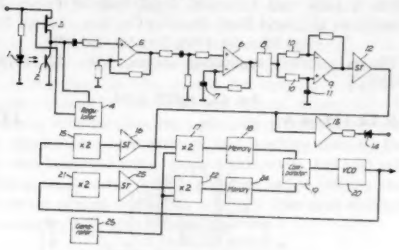
a voltage-controlled pulse generator,

first and second memory means,

a comparator means for controlling said pulse generator and for comparing contents of said first and second memories, whereby disturbances in the form of missing pulses may be suppressed,

said first memory being coupled to the output of said pulse

detector and having means for storing a pulse coming from the pulse detector, and



said second memory being coupled to the output of said pulse generator and having means for storing a pulse appearing at an output of the pulse generator.

4,287,895

ELECTROPALATOGRAPH

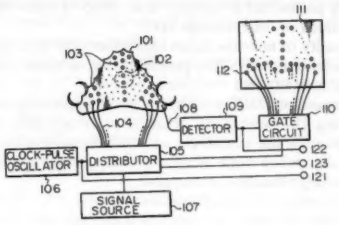
Kiyoharu Hori, Hino, Japan, assignor to Rion Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1980, Ser. No. 127,932

Claims priority, application Japan, Mar. 15, 1979, 54-29328; Mar. 15, 1979, 54-29329

Int. Cl.³ A61B 5/10

U.S. Cl. 128—777 **15 Claims**



1. An electropalatograph comprising an artificial palate formed of an insulative material in a configuration substantially coinciding with the hard palate of a person speech-trained,

said artificial palate having a plurality of signal-transmitting electrodes distributed substantially over an entire surface of the artificial palate to sense an actual linguapalatal contact during a phonation and a single signal-receiving electrode provided to contact with the hard palate as insulated from said signal-transmitting electrodes,

means for scanning sequentially respective said plurality of signal-transmitting electrodes with a series of signals, and

means for recognizing a pattern of at least said actual linguapalatal contact on the basis of said scanning signals received by said signal-receiving electrode as transmitted from certain ones of the signal-transmitting electrodes which have sensed the linguapalatal contact.

4,287,896

ELECTRODE FOR CONNECTING TO AN INTERNAL ORGAN OF HUMAN BODY

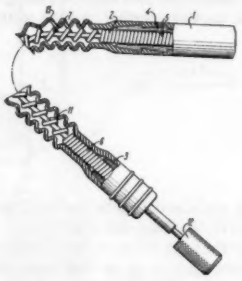
Sergei S. Grigorov, prospekt Vernadskogo, 105, korpus 2, kv. 81, Moscow, and Ravil N. Nazyrov, MIZ, 31, kv. 1, Mozhaisk, both of U.S.S.R.

Filed Aug. 22, 1979, Ser. No. 68,524

Int. Cl.³ A61N 1/04

U.S. Cl. 128—786 **3 Claims**

1. An electrode for connecting to an internal organ of a human comprising, an insulative tubular body, an electrically conductive coil spring lead extending axially in said body, an electrically conductive distal head in said body at one end and electrically coupled to said coil spring lead, an electrically conductive contact head at an opposite end of said body electrically coupled to said coil spring lead, opposite end portions of said coil spring lead having the coils thereof closely adjacent one another, said end portions not exceeding a length twice the distance from a point of contact of said head with the internal



organ to a point where the electrode emerges from said internal organ, a middle portion of said coil spring lead between said end portions, the coils of said middle portion having a pitch greater than the pitch of the coils of said end portions and effective to provide a longitudinal stability of the electrode while being implanted in said human along an intravenous route, and said tubular body comprising a corrugated portion in correspondence with said middle portion of said coil spring lead.

4,287,897

TREATMENT AND OPENING OF ORIENTAL TOBACCO BALES

Warren A. Brackmann, Cooksville, and Albert Kuhner, Schomberg, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Don Mills, Canada

Filed Sep. 26, 1979, Ser. No. 78,963

Claims priority, application United Kingdom, Oct. 3, 1978, 39186/78

Int. Cl.³ A24B 1/02

U.S. Cl. 131—303 **2 Claims**

1. A method of premoistening and opening a burlap-wrapped bale of oriental tobacco, which comprises:

conveying said bale horizontally in a rectilinear direction with the grain of the tobacco in the bale oriented generally transversely of the direction of movement of the bale,

injecting a vertically-aligned plurality of steam jets directly into each side of the burlap-clap bale over the vertical height thereof as said bale is conveyed therepast to cause penetration of steam into the centre of the bale,

removing the burlap covering from the resulting steam-treated bale, and

vibrating the coverless steam-treated bale to cause the bale to fall apart and lose its integrity.

4,287,898

HAIR COMB

Leo L. Konesky, #4 Verona St., Villa Capri, Rio Piedras, P.R. 00924

Filed Jul. 13, 1979, Ser. No. 57,395

Int. Cl.³ A45D 24/00

U.S. Cl. 132—11 R **1 Claim**

1. A comb for use in combing the human hair, comprising a single elongated backing member and teeth formed integrally with the backing member and extending in the same direction therefrom,

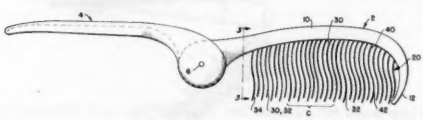
(a) the teeth being arranged in three parallel rows which

extend substantially from end to end of the backing member,

(b) each of the teeth being shaped in a compound curve from end to end and the curvatures of all of the teeth being in the same direction whereby the teeth are substantially parallel,

(c) the spacing of the teeth longitudinally of the backing member being the same in each row and in all three rows,

(d) the teeth of the two side rows being aligned transversely of the backing member and the teeth of the middle row



being positioned longitudinally of the comb midway between those of the side rows,

(e) all of the teeth being of the same cross sectional size and elliptical cross-sectional shape with the major axis of the ellipse being transverse of the backing member,

(f) the free ends of the teeth of the middle row lying in a straight line extending longitudinally of the comb, and

(g) the free ends of the teeth of the two side rows lying in a common plane which is spaced toward the backing member from the straight line of the ends of the teeth of the middle row.

4,287,899

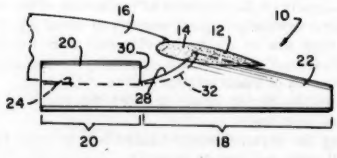
NAIL FORM DEVICE

Eileen Robichaud, 16 Newhill Rd., Methuen, Mass. 01844

Continuation-in-part of Ser. No. 23,908, Mar. 26, 1979. This application May 27, 1980, Ser. No. 153,378

Int. Cl.[3] **A45D** *29/00*

U.S. Cl. 132—73 **10 Claims**



1. A device for forming and attaching a synthetic fingernail to a natural nail comprising, an integral structure having a forward portion and a rearward portion, said forward portion having an upwardly convex surface for supporting the synthetic nail which is to be attached to the natural nail, the rearward portion having a downwardly concave surface for supporting the finger to which the synthetic nail is to be attached, and an opening positioned in the upper portion of said structure having a forward edge formed by said forward portion and a rearward edge formed by said rearward portion, said opening being adapted to receive the forward portion of said finger, the forward edge of said opening being adapted to insert beneath a portion of said natural nail.

4,287,900

COIN DISCHARGE MACHINE

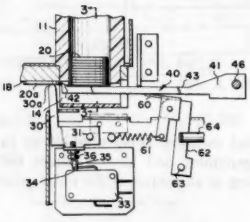
Eiichi Kokubo, and Takatoshi Sugai, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1980, Ser. No. 131,908

Claims priority, application Japan, Mar. 22, 1979, 54-37430[U]

Int. Cl.[3] **G07D** *9/04*

U.S. Cl. 133—4 A **2 Claims**



1. A coin discharge machine wherein coins (**20**) accumulated in at least one cartridge (**11**) are pushed out from the cartridge, one at a time, from the lowermost by at least one selected pair of rod pushers (**40**) into a coin dropping outlet (**17**), which comprises

a plurality of select arm driving solenoids (**65**) selectively actuated in accordance with kinds of coins to be discharged, to bring the selected pair of rod pushers (**40**) to an upper position so that each selected pair of rod pushers (**40**) pushes the lowermost coin (**20***a*) of coins (**20**) accumulated in the cartridge (**11**),

a plurality of microswitches (**33**) selectively actuated by the lowermost coins (**20***a*) pushed by the selected pair of rod pushers (**40**), and

a comparator (**73**) for receiving and comparating data indicating the selectively actuated solenoids (**65**) and data indicating the selectively actuated microswitches (**33**),

whereby, when both of data are not coincedent, the coin discharge machine is stopped.

4,287,901

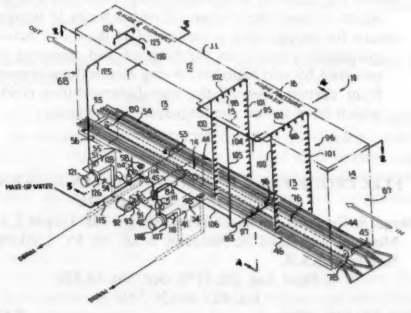
APPARATUS FOR WASHING EGG INCUBATING AND/OR HATCHING TRAYS AND BUGGIES THEREFOR

Douglas Fowler, 5145 Merry La., Gainesville, Ga. 30501, assignor to Douglas Fowler, Hall County, Ga.

Division of Ser. No. 915,234, Jun. 13, 1978, Pat. No. 4,227,938. This application May 23, 1980, Ser. No. 152,829

Int. Cl.[3] **B08B** *3/02*

U.S. Cl. 134—56 R **11 Claims**



1. An apparatus for washing articles comprising a housing

having an entrance opening and an exit opening, means for conveying a carrier carrying articles to be washed from said entrance opening to said exit opening, said housing setting off a washing zone contiguous said entrance opening and a rinse zone contiguous said exit opening, means for guiding a carrier from said entrance opening to said exit opening during the conveyance thereof by said conveying means, nozzle means in said washing zone for directing a plurality of streams of water against articles conveyed through said washing zone by the carrier, said housing having opposite side walls, and said side walls being recessed for receiving therein and protecting said nozzle means against contact by a carrier conveyed through said housing by said conveying means.

4,287,902

METHOD OF TRANSPORTING VISCOUS HYDROCARBONS

Gifford G. McClaflin, and Charles R. Clark, both of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Nov. 5, 1979, Ser. No. 91,014

Int. Cl.³ F17D *1/17*

U.S. Cl. 137—13 **10 Claims**

1. In the method of transporting viscous crude oil through a pipe the improvement which comprises forming an oil-in-water emulsion by adding to said crude oil about 20 to about 80 volume percent of an aqueous solution containing an effective amount of a combination of

(a) about 500 to about 10,000 parts per million, based on said crude oil, of an alkaryl sulfonate having a molecular weight of about 415 to about 470 and being represented by the formula

$$R—Ar—SO_3M$$

wherein Ar is an aromatic moiety which is phenyl, tolyl, xylyl or ethylphenyl, R is a linear or branched-chain alkyl group containing 17 to 22 carbon atoms, and M is sodium, potassium or ammonium, and

(b) methanol, wherein the amount of methanol is in the range of 0.1:1 to 10:1 parts by weight based on the alkaryl sulfonate.

4,287,903

METHOD AND APPARATUS FOR RECOVERING PRODUCTS OF LOW PUMPABILITY

Maurice Cessou, Communay, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

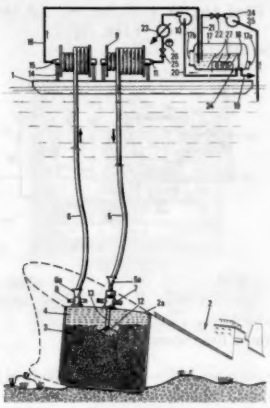
Division of Ser. No. 859,590, Dec. 12, 1977, Pat. No. 4,195,653. This application May 16, 1979, Ser. No. 39,653

Claims priority, application France, Dec. 13, 1976, 76 37849; Feb. 17, 1977, 77 04584

Int. Cl.³ F17D *1/18*

U.S. Cl. 137—13 **6 Claims**

1. A method for removing from a tank a product difficult to pump, comprising connecting to the tank at least one drain pipe, feeding the tank with hot water and discharging the product through the pipe as the hot water is introduced into the tank, wherein an aqueous phase is formed and permanently maintained at the upper part of the tank above the product to be removed, by introducing the hot water in the form of at least one striking and stirring jet in said aqueous phase located



above the product, and discharging the product dispersed in said aqueous phase.

4,287,904

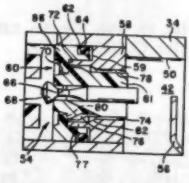
VALVE ASSEMBLY HAVING A PREDETERMINED SHEAR LINE

Gregory A. Kushner, and Jack Martinic, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 22, 1979, Ser. No. 13,848

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—68 R **2 Claims**



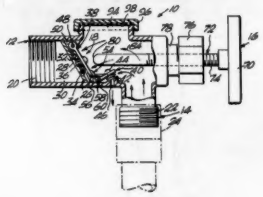
1. In a valve assembly having a body which is received within a bore **50** of a housing, the bore leading to a pressure chamber within the housing, the body having a passage providing communication through the bore, and a valve member carried by the body within the passage, the valve member cooperating with the body in a first position to close the passage and being movable to a second position to open the passage to communicate fluid pressure through the passage to the pressure chamber, characterized by the body including means to provide for shearing of the body at a predetermined location, a portion of the body being movable when the body is sheared to engage the housing and said portion cooperating with the housing to substantially define a secondary passage opening to the pressure chamber when the body is sheared, and the engagement between said portion and the housing substantially defining a restriction within said secondary passage to provide for restricted communication of fluid pressure to the pressure chamber.

4,287,905

ANTI-BACKFLOW VALVE FOR A FAUCET

Gilberto Iglesias, 2940 SW. 99th Ave., Miami, Fla. 33165

Filed Apr. 10, 1980, Ser. No. 138,888
Int. Cl.³ F16K *15/18*
U.S. Cl. 137—102 **10 Claims**



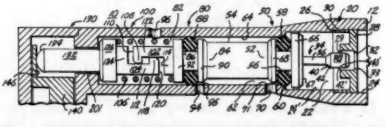
1. An anti-backflow valve comprising
an inlet from a fluid source;
an outlet;
an interior chamber defined by a valve body in fluid communication with the inlet and outlet;
a septum including an inlet port disposed between the inlet and interior chamber;
a check valve within the chamber, pivotally movable in relation to the inlet port to open and close same;
a relief valve pitotally movable in relation to the relief port to open and close same;
valve interlocking means cooperating between the check valve and the relief valve so that the relief valve is closed in relation to the relief port when the check valve is open in relation to the inlet port and vice versa; and
means adjustable between a closed operator position in contact with the check valve to maintain same closed and the interlocked relief valve open, and an open operator position allowing the check valve to open, resulting in closing of the interlocked relief valve.

4,287,906

CONTROL VALVE

Charles J. Green, Vashon, and Alan K. Forsythe, Burton, both of Wash., assignors to Sprague Devices, Inc., Michigan City, Ind.

Filed Mar. 10, 1980, Ser. No. 128,731
Int. Cl.³ G05D *11/00*
U.S. Cl. 137—118 **12 Claims**



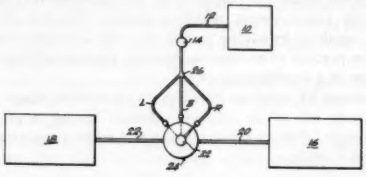
1. A valve for controlling the pressure and volume rate of flow of a fluid delivered to a utilization device comprising:
a valve housing having inlet means for receiving fluid at an elevated pressure, a first outlet means axially spaced from said inlet means for providing fluid at a regulated pressure and rate of flow to the utilization device, a second outlet means axially spaced from said first outlet means for providing fluid pressure to a control means for said utilization device, vent means axially spaced from said second outlet means for selectively venting fluid from said second outlet means, and a regulator valve chamber;
an axially movable valve spool contained in said valve housing have a metering means positioned adjacent said inlet means and adapted to regulate the pressure and flow rate of fluid entering the regulator valve chamber in response to axial movement of said spool;
first valve means positioned on said spool between said regulator valve chamber and said first outlet, said first valve means operable by axial movement of said valve spool to open and close a fluid flow path between said inlet means and said first and second outlet means,
second valve means positioned on said spool adjacent said second outlet means and slidably engaging said housing to selectively connect said second outlet means to said regulator valve chamber or to said vent; and
means to bias said movable valve member against fluid forces in said regulator valve chamber to provide a regulating function for said metering means said second valve means isolating said second outlet from said vent means when said first valve means is closed, and said second valve means connecting said second outlet to said vent means after said first valve means has moved a defined increment between a fully closed position and a fully opened position.

4,287,907

FUEL FEEDING SYSTEM FOR AIRCRAFT

Howard G. Worthy, 6060- 22nd Ave. SW., Naples, Fla. 33942

Filed Aug. 10, 1979, Ser. No. 65,723
Int. Cl.³ F02M *37/00*
U.S. Cl. 137—255 **8 Claims**

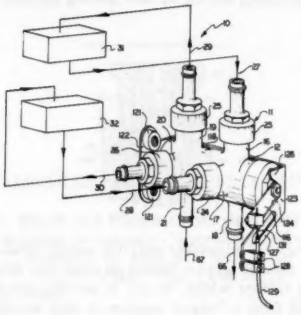


1. A fuel feeding system for aircraft having first and second fuel tanks, and including a fuel selector valve movable between first and second fuel feed positions to an existing aircraft engine, a first fuel line portion communicating between the first tank and said valve in said first position, a second fuel line portion communicating between the second tank and said valve in said second position, a third fuel line portion communicating from said valve in said first position to the engine and a fourth fuel line portion communicating from said valve in said second position to the engine, first and second indicator light means of a first distinctive color, first and second electric circuits from a power source such as a battery and connecting respectively to said first color indicator lights, means associated with said selector valve to selectively energize said first color indicator lights through said first and second circuits to visually indicate the valve position relative to said first and second tanks; first and second indicator lights of a second distinctive color; third and fourth electric circuit means from said source, connecting respectively to said second color indicator lights, first and second switch means in said third and fourth circuit means responsive to a flow of fuel respectively in said third and fourth fuel line portions to illuminate one of said second color lights to indicate an actual fuel flow from one of said fuel tanks to the engine as determined by said selector valve position, means for manual operation of said selector valve, a single indicator light of a third distinctive color, and a fifth circuit means connected from said source to said single light, and switch portion on each of said first and second switch means connected in series in said fifth circuit means in a manner so as to complete a circuit to said third color light only when there is no fuel flow from either of said first and second tanks.

4,287,908
FUEL TANK SELECTOR VALVE

David N. Storgard, Brecksville, Ohio, assignor to Dana Corporation, Cleveland, Ohio

Filed Jul. 30, 1980, Ser. No. 173,448
Int. Cl.[3] F16K 11/16
U.S. Cl. 137—255 11 Claims



1. A valve for selectively connecting one of a pair of alternate fuel supply tanks with a common supply line to and a common return line from a combustion engine, said valve including a housing having a first chamber dedicated to supply fuel from said tanks to said engine and a second chamber dedicated to return unused fuel from said engine to said tanks, actuator shaft means shiftable on an axis between first and second positions, at each chamber first and second tank connecting ports and an engine connecting port, valving means disposed in said chambers, said valving means being radially oriented with respect to said shaft axis, said valving means being responsive to positioning of said shaft in its first position to establish supply flow from a first of said tanks through said first chamber to said engine and return flow from said engine through said second chamber to said first tank while isolating said second tank from supply and return flow connection with said engine, said valving means being responsive to positioning of said shaft in its second position to establish supply flow from a second of said tanks through said first chamber to said engine and return flow from said engine through said second chamber to said second tank while isolating said first tank from supply and return flow communication with said engine.

4,287,909
VALVE FOR DEVELOPING VARIABLE OUTPUT PRESSURE

Clement R. Tompson, 3020 LaPorte, Melrose Park, Ill. 60164, and Garrett Gruner, 1610 W. Kalamazoo, Lansing, Mich. 48915

Division of Ser. No. 46,227, Jun. 7, 1979. This application Jan. 17, 1980, Ser. No. 113,023
Int. Cl.[3] G05D 16/06
U.S. Cl. 137—312 9 Claims

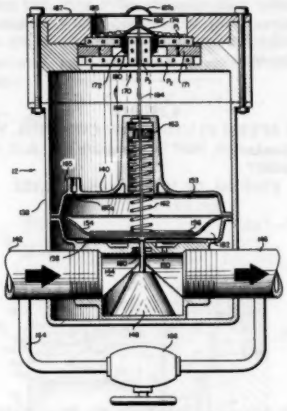
1. In a fluid flow valve having fuel inlet and outlet ports, having a flow restriction device for altering the flow of fluid between the inlet and outlet ports, and having a diaphragm for biasing the restriction device in a position to effect a given fluid pressure at the outlet port, the improvement comprising:

an annular magnet having north and south poles separated by a circular groove;

an armature coil form riding in said groove;

a coil wound on said coil form and receiving a control current indicative of a desired fluid pressure at the outlet port for developing a mechanical force on said coil form in response to the control current, said coil form being constructed of non-ferrous metal for damping its movement and for conducting heat away from the coil; and

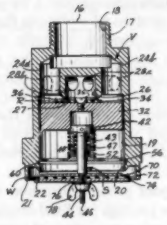
a flexible cable coupled between said armature coil form and the restriction device for responding to the force developed by the coil form so as to vary the bias on the restriction device and vary the fluid pressure at the outlet port at equilibrium.



4,287,910
TANK PRESSURE AND VACUUM RELIEF MECHANISM

Frank H. Petersen, Warren, Pa., assignor to Betts Machine Company, Warren, Pa.

Filed Jul. 25, 1979, Ser. No. 60,300
Int. Cl.[3] F16K 17/196
U.S. Cl. 137—493.9 9 Claims



1. A tank pressure and vacuum relief mechanism for relieving excess pressure or vacuum in a tank interior comprising; an elongated valve housing having an outer end secured in a coacting associated tank wall aperture in an upper wall of an associated tank interiorly thereof with the inner end of the housing disposed in the tank interior, said housing having a longitudinal bore having a vacuum opening at its inner end communicating with the tank interior and forming a vacuum valve seat, said housing having a vacuum passageway connecting said bore with the tank wall aperture whereby the bore is in communication with the atmosphere exteriorly of the tank, said bore having a pressure opening at its outer upper end forming a pressure valve seat, said housing having a pressure passageway connecting said pressure opening with the tank interior, an elongated stem positioned longitudinally in said bore for limited longitudinal reciprocation therein, a normally-closed pressure relief valve operatively disposed in said bore and on the outer end of said stem and selectively reciprocable toward and away from said pressure valve seat for controlling fluid flow through said pressure opening and pressure passageway, a normally-closed vacuum relief valve disposed on the stem adjacent its inner end and selectively reciprocable toward and away from said vacuum valve seat for controlling fluid

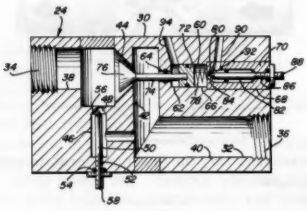
flow through said vacuum opening and vacuum passageway, pressure bias means operatively disposed on said stem for maintaining said pressure relief valve in a normally-closed position against said pressure valve seat, and vacuum bias means operatively disposed on said stem for maintaining said vacuum relief valve in a normally-closed position against said vacuum valve seat.

4,287,911

THREE SPEED FLUID FLOW CONTROL VALVE

Donald D. Houdeshell, 1647 N. Township Rd., R.R. #2, Republic, Ohio 44867

Filed Jul. 25, 1980, Ser. No. 172,152
Int. Cl.³ F15B *13/04*
U.S. Cl. 137—513.7 **8 Claims**



1. A control valve for series connection in a fluid flow control line in which alternating fluid flow in opposite directions at different speeds is desired and with the fluid flow in one direction being allowed at a substantially constant high rate and the fluid flow in the opposite direction is initially allowed at generally the same rate and is thereafter gradually throttled to a slower flow rate, said valve including a body having a main flow passage therethrough and a by-pass passage therein by-passing a central portion of said main flow passage, throttle means operative to adjustably throttle the fluid flow rate through said by-pass passage, and control valve means in said main flow passage central portion supported from said body for shifting between open and closed positions allowing fluid flow therepast at a rate slightly slower than said high rate in said one direction and at least substantially terminating fluid flow therepast in said closed position, means yieldingly biasing said control valve to said open position, said control valve including a fluid impact portion disposed in said central portion of said main flow passage for fluid impact pressure thereon to shift said control valve toward said closed position against said means biasing said control valve toward said open position, and adjustable rate movement dashpot means operatively connected between said body and control valve operative to vary the closing rate of said control valve.

4,287,912

MONOFLOW BALL VALVE AND SYSTEM

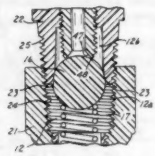
Charley L. Hewett, Englewood, Colo., assignor to Kem-O-Kleen, Inc., Englewood, Colo.

Filed Mar. 24, 1980, Ser. No. 133,637
Int. Cl.³ F16K *15/04*
U.S. Cl. 137—516.27 **22 Claims**

1. A monoflow ball valve for controlling fluid flow comprising:

a valve body having an internal flow passage with an inlet and an outlet, said valve body having a first portion with a first passage section and a second portion with a second passage section, a shoulder at the inner end of said second portion and a spacing surface within said second portion;

a resilient, ccmpressible ball in said passage, said ball having an external dimension less than the internal dimension of said first passage section to slide therein and greater than the internal dimension of said second passage section, said ball being normally seated on said shoulder in a contacting position to block fluid flow toward said inlet, said ball being movable away from contact with said shoulder to permit fluid flow toward said outlet, said ball being movable into the inside of said second passage section in a compressed position to form a fluid-tight seal to prevent backflow from said outlet to said inlet, the extent to which said ball extends into said second passage section toward said inlet being limited by said spacing surface; and



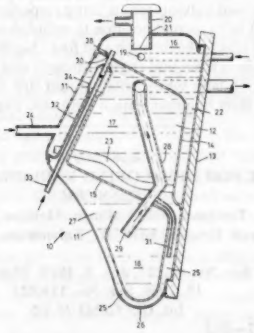
an inlet member adjustably movable axially relative to said second passage section having an inner end defining said spacing surface which, in use, is suitable for dislodging said ball from a lodged position in said second section upon the movement of said inlet member toward said outlet.

4,287,913

TANK SUITABLE FOR HOLDING LIQUIDS

George H. Bennett, Hendon; Alfred W. Osborn; Clive N. Bunyan, both of Harrow, and Ronald A. Midgley, St. Albans, all of England, assignors to Rolls-Royce Limited, London, England

Filed Aug. 12, 1980, Ser. No. 177,513
Claims priority, application United Kingdom, Sep. 29, 1979, 33866/79
Int. Cl.³ F16K *24/04*
U.S. Cl. 137—574 **8 Claims**



1. A tank suitable for holding a liquid comprising first and second baffles adapted to divide the interior of said tank into first, second and third series interconnected chambers, each adapted to contain said liquid, and inlet adapted to supply a mixture of a gas and said liquid to said first chamber, an outlet adapted to withdraw said liquid from said third chamber and venting means having an outlet through which said gas present in said first chamber is vented, said baffles being so adapted and arranged that when said tank is in its normal spacial disposition, liquid supplied in operation to said first chamber flows into said third chamber via said second chamber, and if said tank subsequently adopts a spacial position other than said normal spacial disposition, the flow of liquid from said third chamber to said second chamber is prevented or is of a suffi-

ciently low level that an adequate quantity of liquid is retained within said third chamber to provide a continuity of liquid flow through said outlet for a finite time period and unsufficient liquid flows from said second chamber into said first chamber to obstruct said venting means.

4,287,914

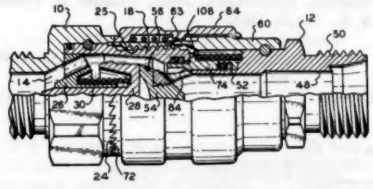
SELF SEALING COUPLING WITH FULL FLOW RELIEF VALVE

Richard A. Buseth, and William C. Marrison, both of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Jan. 16, 1980, Ser. No. 112,639

Int. Cl.³ F16L *37/28;* F16K *31/12*

U.S. Cl. 137—613 **6 Claims**



1. A self sealing quick disconnect fluid coupling fitting for use with a pressurized fluid system adapted to be selectively coupled and uncoupled to another fitting characterized by its ability to function as a pressure relief valve when uncoupled, comprising, in combination, a tubular body having an axial passage defined therein, a conduit connection end and a coupling end, coupling means defined on said body adjacent said coupling end for coupling said body to said another fitting, valve structure mounted upon said body adjacent said coupling end adapted to automatically open and close upon said body being coupled and uncoupled at said coupling end, respectively, with respect to said another fitting, said valve structure comprising first and second valve members within said passage relatively movable between open and closed positions controlling fluid flow through said passage, one of said members being fixed relative to said body, positioning means supporting the other member on said body for axial movement thereto between a closed position engaging said one member and an open position axially spaced from said one member, said other member being engaged by said another fitting upon coupling of said fittings moving said other member to said open position, said other valve member further including at least one radially extending surface exposed to fluid pressure within said passage when said other member is in said closed position so oriented to said other member that fluid pressure exerted thereon produces an axial force on said other valve member in the direction of said member open position, and spring means axially biasing said other member in the direction of said member closed position counter to the fluid pressure force, the area of said surface and the force of said spring means being preselected to permit the fluid pressure within said passage to axially displace said other valve member to said open position upon the fluid pressure reaching a predetermined value whereby fluid pressure is released through said body coupling end.

4,287,915

CONTROL VALVE FOR PNEUMATIC CONDUITS

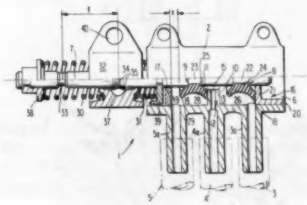
Rüdiger Hoffmann, Sindelfingen, and Dieter Feichtiger, Aidlingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 21, 1980, Ser. No. 151,988

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922681

Int. Cl.³ F16K *31/44*

U.S. Cl. 137—625.5 **14 Claims**



1. A control valve for controlling a routing of a pressure medium from a central pneumatic conduit to further pneumatic conduits disposed to the left and right of the central pneumatic conduit, the control valve including a housing provided with a cylindrical recess, a control slide means longitudinally displaceably guided in the cylindrical recess, and valve sealing means for alternatingly communicating the central pneumatic conduit with the further pneumatic conduits disposed to the left and right thereof upon execution of an operating stroke of the control slide means, characterized in that the control valve further includes two compression spring means supported on the control slide means, an operating sleeve longitudinally displaceably supported on the control slide means between the two compression springs, detent means for defining respective end positions of the displacement path of the operating sleeve, and means for enabling an axial displacement of the operating sleeve such that the operating sleeve, upon exceeding a predetermined resistance, is disengaged from one of the detent means, and, upon further axial displacement, engages in the other detent means against a force of one of the compression spring means.

4,287,916

SEMISPHERICAL SHAPE VALVE DEVICE IN BLADDER TYPE ACCUMULATORS

Kazuo Sugimura, and Nobuyuki Sugimura, both of 308, Mabase, Shimizu-shi, Shizuoka-ken, Japan

Filed Oct. 24, 1979, Ser. No. 87,701

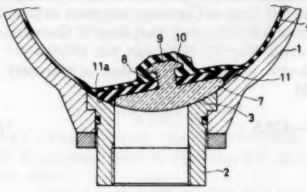
Claims priority, application Japan, Sep. 5, 1978, 53/108943

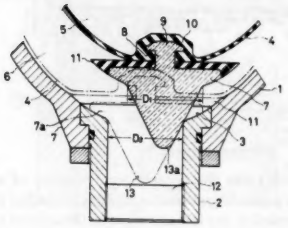
Int. Cl.³ F16L *55/04*

U.S. Cl. 138—30 **13 Claims**

1. In a bladder type accumulator consisting of a vessel enclosing a bladder to be filled with pressure gas, a liquid pipe connected to the bottom of the vessel to be opposed to the free end of the bladder, the improvement characterized by the top end of the liquid pipe being formed as a valve seat to be opened and closed by the mating thereof by a spherical valve body

which is secured to the bottom of the bladder and is larger in diameter than said valve seat to assure closure of said valve





seat and to prevent extrusion of the bladder therebetween should said valve body eccentrically engage said valve seat.

4,287,917

DIAPHRAGM DEVICE FOR DAMPING VIBRATIONS IN FLOWING LIQUIDS

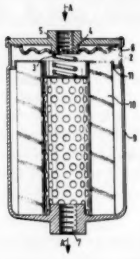
Günter Frey, Fellbach, Fed. Rep. of Germany, assignor to Knecht Filterwerke GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 8, 1979, Ser. No. 92,327

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1978, 2849925; Nov. 17, 1978, 2849926

Int. Cl.[3] **F16L** *55/04*

U.S. Cl. 138—30 **3 Claims**



1. A liquid flow damping device comprising a housing (1) a liquid inlet opening (4) in said housing, said housing having an end wall extending outwardly from the inlet opening and an annular seating at the inner side of the inlet opening, said housing having a peripheral wall at the periphery of the end wall, a diaphragm free from openings within its periphery, said diaphragm having its peripheral margin adapted to seat on said end wall and spaced from said peripheral wall, said diaphragm being adapted to seat at a central part thereof as a valve plate against said annular seating to close said inlet opening in which condition there is a liquid space (6) between the diaphragm and said end wall disposed radially between said central part and the periphery of the diaphragm, an opening (5) leading from said inlet opening to said space, a spring engaging said central part of the diaphragm on its downstream side to urge it against said annular seating, support means for the spring, an outlet opening in said housing (7), said diaphragm being sufficiently flexible to oscillate at its periphery and permit flow of liquid only when liquid current commences, said central part of the diaphragm lifting off said seating under liquid pressure said spring permitting the central part of the diaphragm to vibrate off, said annular seating against the force of said opening when liquid flow occurs.

4,287,918

APPARATUS FOR MANUFACTURING A SLIDE FASTENER STRINGER HAVING A WOVEN COILED COUPLING ELEMENT

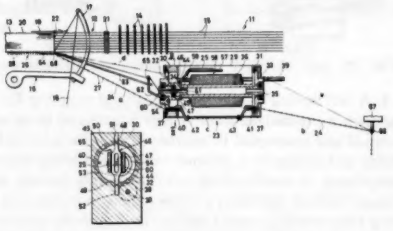
Muchiji Shimono, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 5, 1979, Ser. No. 90,997

Claims priority, application Japan, Nov. 20, 1978, 53-142999

Int. Cl.[3] **D03D** *41/00*

U.S. Cl. 139—35 **2 Claims**



1. An apparatus for manufacturing a slide fastener stringer including a woven stringer tape and a coiled coupling element woven into the stringer tape along a longitudinal edge thereof, comprising:

(a) means for weaving the stringer tape of warp and weft threads;

(b) a mandrel for extending at an angle to the warp threads, said mandrel having a portion to be located adjacent to the fell of the stringer tape being woven;

(c) means for winding a monofilament around said portion of said mandrel to form the coiled coupling element, which is then woven into the stringer tape by the weft thread, said winding means having means for guiding the monofilament to revolve in a first conical orbital path; and

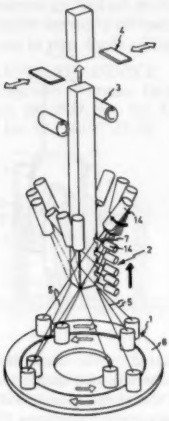
(d) means for guiding the monofilament toward said winding means in a second conical orbital path, said last-mentioned guiding means being fixedly located in substantially three-dimensional point-symmetry relation to said portion of the mandrel with respect to the center of said winding means, whereby said first and second conical orbital paths are substantially identical in shape with each other, thereby allowing the length of a portion of the monofilament extending between said last-mentioned guide means and said portion of the mandrel to be kept substantially constant at all times to maintain the tension of said portion of the monofilament substantially uniform during revolving movement of the monofilament.

4,287,919

PROCESS IN THE MANUFACTURE OF SPACE FRAMEWORKS, AND A MACHINE FOR THE MANUFACTURE THEREOF

Hans C. Georgii, Stockholm, Sweden, assignor to AB Hydro Betong, Sweden

Filed May 18, 1979, Ser. No. 40,382
Claims priority, application Sweden, May 23, 1978, 7805891
Int. Cl.³ B21F *27/10*
U.S. Cl. 140—112 **6 Claims**



1. A process in the manufacture of a space framework such as in section has straight sides and comprises two multi-wire systems of spirally wound wires (5), the wires (5) of which, in one system are wound in one direction and in the other system are wound in the other direction, being interconnected at points where they intersect, wherein said wires (5) in both systems are wound simultaneously in opposite directions during the simultaneous advancement of the finished portion of the space framework at a rate corresponding to the pitch of the spiral windings, including steps of catching pairs of counter-running wires (5) at those points where they, during the winding operation, intersect at the outer contour of the space framework by means of welding electrodes in the form of holders (7) to follow the points of intersection of the counter-running wires (5) caught thereby at the speed at which the framework is advanced, thereby bending and leading the wires (5) to the final contour of the space framework, and welding the wires (5) at the same time such wires (5) are being bent and led to the final contour of the space framework to effect interconnection of the wires (5) at the points of intersection.

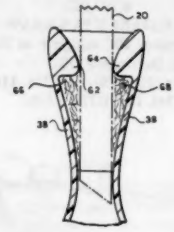
4,287,920

SELF-SEALING VALVE

Glenn W. Johnson, Jr., 10 Friar Tuck Cir., Summit, N.J. 07901

Continuation-in-part of Ser. No. 842,961, Oct. 17, 1977, abandoned. This application Jul. 23, 1979, Ser. No. 59,746
Int. Cl.³ B65B *3/17*
U.S. Cl. 141—85 **4 Claims**

1. In an inflatable article having an integral valve; comprising at least a pair of sheets bonded together along their periphery in the shape of the article, said valve being joined to and extending from said periphery and being extensions of said sheets, the outer housing of the valve being formed by said sheet extensions sealed together along side edges to leave outer edges of the sheets unattached and forming an opening through which the article is inflated; and at least one of said outer edges being folded inwardly of and positioned within said outer housing to provide a flap responsive to the pressure of the fluid in the article to maintain the flap in a position effective to seal the valve wherein the improvement comprises: means disposed on the surface of said at least one flap to bias the flap into sealing position, said biasing means comprising a thin layer of a tacky, grease-like substance, and means for



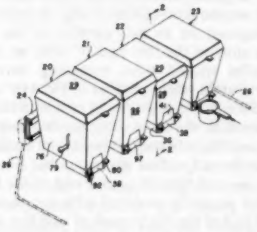
maintaining an adequate supply of said substance in the vicinity of said flap comprising a member extending transversely inwardly of said valve to form a recess for receivably storing said tacky, grease-like substance interiorly of said valve.

4,287,921

CANISTER SET

Robert B. Sanford, 7605 Walton La., Annandale, Va. 22003

Filed Jun. 5, 1979, Ser. No. 45,787
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—360 **4 Claims**



1. A dispensing canister for flowable solids comprising a hopper body and supporting means therefor, a measuring chamber at the bottom of the hopper body and receiving with the assistance of gravity flowable solids from the hopper body, upper and lower movable closure gates for the top and bottom of said measuring chamber, the upper closure gate being arcuate and having horizontal axis rotational support means, the lower closure gate being flat and horizontally movable and having linear horizontal guide means on opposite sides of the measuring chamber, crank arms for driving the upper closure gate attached to said rotational support means, drive elements for the lower closure gate fixed to opposite sides of the lower closure gate, an approximately U-shaped bail having spaced arms straddling the upper and lower closure gates and measuring chamber, corresponding ends of said arms being drivingly connected to said crank arms, intermediate portions of said arms being formed to provide lost motion loops therein and said drive elements being engaged movably within said lost motion loops, a spring means connected with said bail and biasing it toward a position which opens the upper closure gate and closes the lower closure gate, the bail including a driving crossbar, and a trap chamber having linear movement guided engagement with the bottom of the hopper body on a path of movement parallel to the movement of the lower closure gate and including pusher elements drivingly engaged with said crossbar, said trap chamber having a recessed front wall for ready engagement by a receptacle receiving flowable solids,

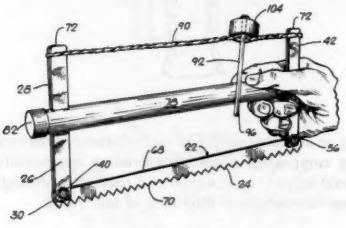
and the trap chamber being bodily separable from the hopper body for emptying.

4,287,922

FOLDABLE BUCKSAW

John R. Nelson, Lemont, Ill., assignor to Research, Development & Marketing, Barrington, Ill.

Filed Jan. 28, 1980, Ser. No. 116,020
Int. Cl.³ B27B *21/00*
U.S. Cl. 145—32 R **6 Claims**



1. A foldable bucksaw comprising an elongated tube having a cavity extending therein from one end thereof along the axis of elongation of the tube, said tube having a first pair of slots disposed therein at one end thereof, slots of said first pair being disposed on opposite sides of the tube and disposed on an axis traversing the axis of the tube, said first pair of slots being closed and having spaced flat ends, said tube having a second pair of slots disposed therein at the other end of the tube, the slots of said second pair of slots being on opposite side of the tube and disposed on an axis parallel to the axis extending between the slots of the first pair of slots, an elongated blade having parallel spaced sides extending between the ends thereof and straight edges parallel to the axis of elongation of the blade, said parallel edges being spaced from each other by a distance less than the cross sectional dimension of the cavity of the tube, said blade having a plurality of cutting teeth on one of the edges thereof, a first elongated bar pivotally mounted adjacent to one end thereof on one end of the blade, a second elongated bar pivotally mounted adjacent to one end thereof on the other end of the blade, each of said first and second bars having parallel spaced flat sides and spaced edges parallel to the axis of elongation thereof, the edges being spaced by a distance less than the cross sectional dimension of the cavity of the tube, the first bar being slidably disposed and extending through the first pair of slots with the edges thereof in slidable abutment with a flat end of each of the slots of the first pair of slots, and the second bar being slidably disposed and extending through the second pair of slots, the pivotal axes between the blade and first and second bars being normal to the flat sides of the blade and the respective bar, and removable tensioning means mounted on the other end of the first and second bar and urging said other ends of the first and second bars toward each other, whereby the tensioning means may be removed, the bars removed from the slots and pivoted to positions parallel to and adjacent to the blade, and the blade and bars inserted into the cavity of the tube from the one end thereof.

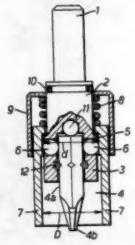
4,287,923

SCREWING HEADS

Ewald Hornung, Forstweg 144, 3260 Rinteln 6, Fed. Rep. of Germany

Filed Mar. 30, 1979, Ser. No. 25,606
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843684
Int. Cl.³ B25B *15/00*
U.S. Cl. 81—429 **7 Claims**

1. A screwing head, comprising shank means adapted to be rotatably driven, said shank means having a longitudinal axis and said shank means having an end portion of annular cross-section, said end portion of annular cross-section defining a seat, a screwdriver bit comprising a shank part, said shank part being located in said seat, locking members for releasably locking the shank part of the screwdriver bit within the seat so that the screwdriver bit can be rotated by the shank means, said locking members being mounted in the end portion of annular cross-section for movement transversely of the longitudinal axis of the shank means between radially inner positions in which the locking members lock the shank part of the screwdriver bit for rotation with the shank means, and radially outer positions in which the locking members release the shank part of the screwdriver bit to permit relative rotation between the shank means and the shank part of the screwdriver bit, an



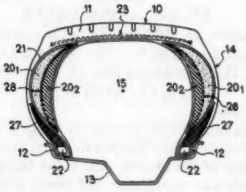
annular casing mounted on the shank means for longitudinal movement relative thereto, said casing surrounding the annular end portion of the shank means and having an internal surface, said internal surface comprising a portion of relatively small internal diameter and a portion of relatively larger internal diameter, said casing being movable longitudinally relative to the shank means from a locking position in which the small internal diameter portion holds the locking members in the radially inner positions and a release position in which the locking members can move radially outwardly into the larger internal diameter portion, and spring means biasing the casing into its locking position, the casing being movable from its locking to its release position by engagement with a workpiece upon a predetermined depth of screwing being attained.

4,287,924

SAFETY TIRE WITH SIDEWALL SUPPORT MEMBERS HAVING TWO PARTS WITH DIFFERENT FLEXIBILITIES

Alphonse Deck, Meudon, and Claude Lefaucheur, Paris, both of France, assignors to Pneumatiques, Caoutchouc Manufacture et Plastiques, Kleber-Colombes, France

Filed May 10, 1979, Ser. No. 37,889
Claims priority, application France, May 10, 1978, 78 13891
Int. Cl.³ B60C *17/00, 15/00, 9/08*
U.S. Cl. 152—153 **5 Claims**



1. A safety tire comprising a tread reinforced by an inextensible belt, spaced beads each having a bead core and bead fillers, side walls for connecting the beads to the sides of the tread and for defining an inflatable central chamber, a carcass extending below the tread and into each side wall having ends that are curved around the bead cores and bead fillers of each bead,

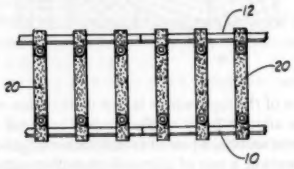
support members formed of elastomeric material having a lenticular cross sectional shape extending into each side wall on the inside of the carcass from the vicinity of the beads up to the edges of the inextensible belt for reinforcing the tread, each support member being formed of two parts with different flexibilities, one part being located adjacent to the carcass and having a Shore A hardness not greater than 70 and an elasticity modulus not greater than 80 bars and the other part being made of a less flexible elastomeric material and having a Shore A hardness between **80** and **95** and an elasticity modulus between 70 and 100 bars.

4,287,925

ANTISKID DEVICE

Robert Spann, 121 Kingsbury, Norman, Okla. 73069

Filed Dec. 10, 1979, Ser. No. 101,889
Int. Cl.³ B60C *27/00*
U.S. Cl. 152—221 **8 Claims**



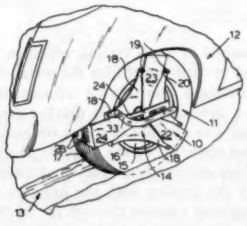
1. An antiskid device for pneumatic tires comprising:
a pair of opposed, spaced, annular sidewall elastomeric tubular elements;
a plurality of spaced transverse traction straps extending between and connected to each of said tubular elements, each of said traction straps comprising:
a woven nylon primary substrate at one side of the strap;
a woven nylon secondary layer spaced from said substrate;
a layer of rubber between, and bonded to, said nylon substrate and said nylon second layer; and
a body of rubber bonded to said nylon second layer on the side thereof opposite said layer of rubber, and including a plurality of nubs of rubber projecting therefrom, each of said nubs including a base having a frizzed neck projecting outwardly therefrom, said traction strap construction being such that when said primary substrate engages the face of a tire upon which the device is mounted, said body of rubber faces outwardly in a ground engaging position and is tensioned through its extension through a greater distance than said primary substrate.

4,287,926

TIRE TRACTION DEVICE

James K. C. Wong, 5100 Marine Dr., Chicago, Ill. 60640

Filed Jun. 26, 1979, Ser. No. 52,249
Int. Cl.³ B60C *27/04, 27/20*
U.S. Cl. 152—225 C **10 Claims**



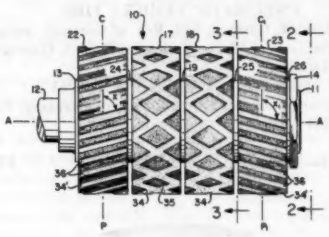
1. A traction device for application to driven wheels which comprises a mounting base adapted to be positioned over the outer face of the wheel to extend radially beyond the wheel rim, a stud mounted on and projecting outwardly from the central portion of said base, a plurality of superimposed J-shaped fingers pivotally stacked on said stud and radiating from said base having cups for receiving the periphery of the wheel, road gripping tread surfaces on said cups, means accommodating radial movement of one of said fingers on said stud, and means on said base capable of retracting said one of said fingers to clamp all of the fingers on the periphery of the wheel.

4,287,927

MULTIPLE RING TIRE

Vito A. Caravito, Uniontwon, and Grover W. Rye, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 921,061, Jun. 30, 1978, abandoned.
This application Apr. 4, 1980, Ser. No. 137,470
Int. Cl.³ B60C *7/00*
U.S. Cl. 152—302 **6 Claims**



1. A tire and rim assembly comprising a rim of substantially rigid material connected to an axle and rotatable about an axis, said rim having a tire-supporting surface, a tire of resilient elastomeric material including a pair of annular side elements mounted on said tire-supporting surface, an annular central element mounted on said tire-supporting surface, said central element being interposed between and axially spaced apart from said side elements, each of said side elements and said central element having a radially outer belt portion, a radially inner bead portion and a load-carrying and cushioning intermediate structure positioned between said inner bead portion and said outer belt portion, said intermediate structure having a plurality of generally radially extending flexible resilient strap members connected to said outer belt portion and to said inner bead portion, and each of said side elements having a spring rate which is not equal to the spring rate of said central element.

4,287,928

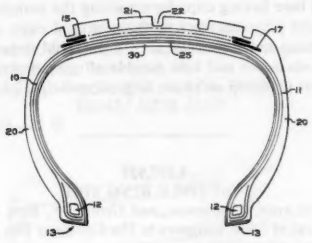
PUNCTURE-SEALING TIRE

Robert W. Hallman, Medina, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 28, 1977, Ser. No. 791,760
Int. Cl.³ B60C *5/14*; B29H *17/14*
U.S. Cl. 152—346 **24 Claims**

1. In a puncture-sealing tubeless pneumatic tire comprising two spaced inextensible beads, a ground contacting tread portion, a pair of individual sidewalls extending radially inward from the axial outer edges of said tread portion to join the respective beads, a carcass portion, and a tire sealant layer disposed inwardly of said carcass portion, the improvement comprising an integral layer of vulcanized tack rubber disposed between said carcass and said sealant, wherein said tack rubber comprises at least one polymer selected from the group consisting of cis-polyisoprene and natural rubber and said tack

layer has a vulcanized Shore A durometer of from about 25 to about 40 and a thickness in the range of from about 0.1 to about



30 percent of the total tire thickness, and wherein said tack layer is substantially free of antioxidants.

4,287,929

PNEUMATIC VEHICLE TIRE

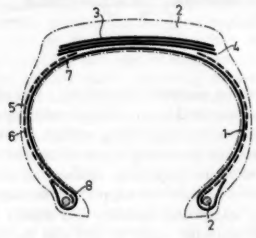
Heinrich Huinink, Garbsen, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Feb. 8, 1980, Ser. No. 119,763

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1979, 2905244

Int. Cl.³ B60C *9/08*

U.S. Cl. 152—354 R **3 Claims**



1. A pneumatic vehicle tire having a hollow inner chamber defined by a rubbery body with inner periphery as well as outer periphery and comprising in combination:

a tread included with the body;

a shoulder region of the body on each side of and adjacent to said tread;

a sidewall of the body on each side of and adjacent to said shoulder regions;

a bead section adjacent each of said sidewalls;

a bead core in each of said bead sections;

a reinforcement having an edge located along inner periphery as inserted extending at least approximately radially and including a radially inner first rayon cord fabric layer directed toward said hollow inner chamber, and two radially outer second polyamide cord fabric layers, said first layer having a first elasticity and extending from one bead section to another and being anchored therein along outer periphery and simultaneously along inner periphery by being looped around the respective bead cores; and

a pull-resistant belt located between said tread and said first layer, extending essentially over the width of said tread between said should regions, and essentially stabilizing the tire body against lateral forces, said second layers having a greater elasticity than said first layer, one of said second layers being located in each of said sidewalls and extending from a respective bead section to the respective adjacent shoulder region, with that edge of the respective second layer which is located in said pertaining shoulder region being located between a pertaining edge of said belt and said first layer.

4,287,930

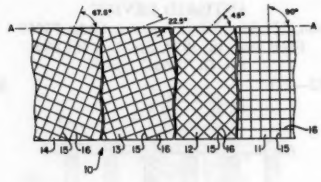
TIRE AND METHOD OF REINFORCEMENT

Kenneth W. McIntosh, Cuyahoga Falls, Ohio, and Edward B. Colby, Jr., Audubon, Pa., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 11, 1980, Ser. No. 139,412

Int. Cl.³ B60C *9/02*

U.S. Cl. 152—357 R **28 Claims**



1. A tire of the type which is cast or injection molded comprising an annular body of elastomeric material having a U-shaped cross section, a pair of radially inner edges of said body, a crown portion, a pair of sidewalls extending radially outward from said inner edges and connected to said crown portion, overlapping, multidirectional reinforcing strands positioned in at least one of said sidewalls to define openings between said strands for striking through of elastomer forming material during molding to provide encapsulation of said strands and interlocking with said annular body.

4,287,931

VACUUM-FORMING PROCEDURE IN METAL CASTING

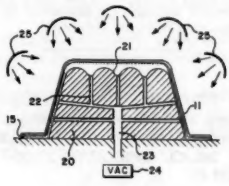
Anton Vogt, Hanau, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 148,376

Claims priority, application Fed. Rep. of Germany, May 9, 1979, 2918571

Int. Cl.³ B22C *9/02, 23/08*

U.S. Cl. 164—7.2 **4 Claims**



1. In the method of metal casting which includes placing a pattern in sand to form a mold for the metal, the steps which include pre-coating a thin film of translucent thermoplastic material with a thin layer of finely divided graphite, applying infrared radiation to the film to soften the same facilitated by the radiant heat absorbed by the graphite, then while the film is still in soft drawable condition vacuum-forming the film onto the surface of the pattern with the graphite sandwiched in between by applying vacuum through the body of the pattern so that the graphite serves as a lubricant for the plastic film as the film is drawn about irregular surfaces on the pattern to produce a tightly conforming barrier layer, molding sand about the pattern and its barrier layer to form a mold, and then removing the pattern from the mold while leaving the film in

the form of the barrier layer in conforming and supporting contact with the sand.

4,287,932

PROCESS FOR THE PRECISION MOLDING OF CASTINGS

Hans Schneider, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 20, 1980, Ser. No. 179,674

Claims priority, application Switzerland, Sep. 10, 1979, 8131/79

Int. Cl.³ B22D *29/00*

U.S. Cl. 164—516 **11 Claims**

1. A process for the precision molding of castings, said process comprising the steps of

forming a lost pattern with at least one inserted core of a metal which is oxidizable below the solidification temperature of a melt to be cast;

thereafter forming a ceramic mold about said pattern and core;

dissolving the pattern out of the ceramic mold;

thereafter firing and heating the ceramic mold to a predetermined temperature; and

pouring a melt of molten metal into the ceramic mold, whereby after solidification of the melt into a casting, the core metal oxidizes and sublimates to escape out of the casting.

4,287,933

CONTINUOUS CASTING METHOD WITH ROTARY MELT MOVEMENT

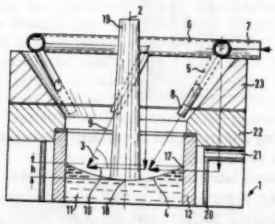
Emil Elsner, Baden-Baden, and Leo Heinen, Kehl, both of Fed. Rep. of Germany, assignors to Korf-Stahl AG, Baden-Baden, Fed. Rep. of Germany

Filed Oct. 31, 1978, Ser. No. 956,380

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1977, 2749405

Int. Cl.³ B22D *11/04, 11/10*

U.S. Cl. 164—452 **12 Claims**



1. In a continuous metal casting method, especially continuous steel casting method, in which the melt is set into rotatory movement about the strand axis within a continuous casting mold and gas in the gaseous or liquid state is fed onto the bath surface of the melt eccentrically to the mold axis and at an acute angle to the velocity vector of the rotatory movement, the improvement comprising: providing a substantially rectangular-shaped mold cavity, delivering molten metal into said mold cavity coaxially with said mold axis, and setting said melt into said rotatory movement substantially by the thrust of the gas directed onto said bath surface.

4,287,934

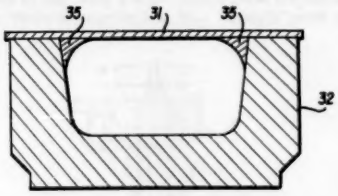
CONTINUOUS CASTING MOLD

George C. Ward, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 860,648, Dec. 14, 1977, Pat. No. 4,211,271. This application Jun. 23, 1980, Ser. No. 162,237

Int. Cl.³ B22D *11/06*

U.S. Cl. 164—482 **5 Claims**



1. An improved process for the continuous casting of metal of the type wherein molten metal is cast into a continuously advancing molding cavity formed by at least one endless moving band in conjunction with other mold surfaces so as to form a molding cavity having at least one sharp corner at the junction of said band and said other mold surfaces, and wherein the molten metal is solidified in the shape of said molding cavity to form a cast bar which is then extracted for further processing, wherein the improvement comprises the steps of:

introducing a fixed shaping means for eliminating the sharp corner into said advancing molding cavity near said junction; casting molten metal into the cavity and adjacent said shaping means; advancing the cavity without advancing the shaping means; cooling the molten metal to form a solid shell adjacent the mold surfaces while forming a non-sharp edge on the solidifying cast bar; advancing the cast bar with the cavity while sliding the cast bar along the shaping means and extracting the cast bar from the mold for further processing.

5. Improved apparatus for the continuous casting of metals of the type having a continuously advancing molding cavity formed by an endless moving band in cooperation with a peripheral groove in a rotating casting wheel which is adapted to receive molten metal and solidifying said metal in the shape of said cavity to form a continuous length of cast bar, wherein the improvement comprises:

an additional mold defining means for eliminating the sharp corner of the molding cavity which would otherwise occur at the junction of said band and said wheel, said means extending into the molding cavity without advancing as the casting wheel rotates and adapted to provide a barrier between cast molten metal and said junction.

4,287,935

VERTICAL DIE CASTING MACHINE

Toyoaki Ueno, Yamaguchi, and Masashi Uchida, Ube, both of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Jun. 25, 1980, Ser. No. 162,804

Claims priority, application Japan, Jul. 26, 1979, 54-94237; Jul. 31, 1979, 54-96789

Int. Cl.³ B22D *17/12*

U.S. Cl. 164—314 **10 Claims**

1. A vertical die casting machine, comprising:

a stationary platen;

a stationary mold secured to said stationary platen, to define a die cavity, with a movable mold;

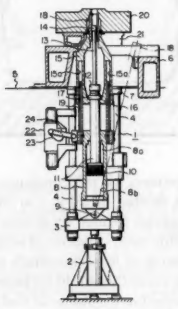
a casting sleeve having an upper end for abutting against said stationary mold from below said stationary mold;

a plunger slidably disposed in said casting sleeve, said plunger having a plunger tip at the upper end thereof which defines, with said casting sleeve, a space in said

casting sleeve, in which space a molten metal to be injected by said plunger into said die cavity is received;

a hollow block having an axial bore, a lower end portion of said casting sleeve being connected to an upper portion of said block, said plunger extending axially downwardly in the bore of said block, the bore of said block being restricted in a lower portion of said block, and;

a hydraulic casting cylinder, mounted to said stationary platen, for actuating a casting piston rod, said casting piston rod being connected to a lower end of said plunger to form, together with said plunger, a piston extension,



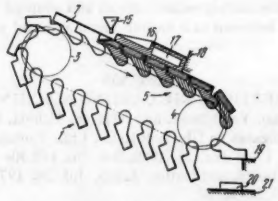
said block being mounted to said casting cylinder and including means for an axial movement thereof relative to said cylinder, said piston extension having within the bore of said block a radial projection, whereby the lower portion of said block serves as a stopper against said projection when said casting piston rod moves downwardly and said projection serves as a stopper against the lower portion of said block when said block moves upwardly, so that an axial length of said space for the molten metal is maintained constant regardless of the axial movements of said casting sleeve and said plunger tip.

4,287,936

INGOT CASTING APPARATUS

Efim Y. Ljublinsky, Vitebsky prospekt, 53, korpus 1, kv. 47, Leningrad; Viktor A. Smirnov, ulitsa Popova, 44, kv. 13, and Anatoly A. Kostylev, ulitsa Bazstroevskaya, 8, kv. 26, both of Krasnoturiinsk Sverdlovskoi oblasti, all of U.S.S.R.

Filed Nov. 16, 1978, Ser. No. 961,249
Int. Cl.³ B22D *5/04, 9/00, 29/04*
U.S. Cl. 164—329 **3 Claims**



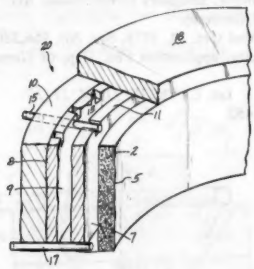
1. In an ingot casting apparatus comprising open top ingot moulds hinged to an endless revolving hauling chain of an inclined conveyer and means for feeding molten metal into open tops of said ingot moulds, wherein the improvement comprises: ingot moulds arranged on an upper descending branch of said endless hauling chain of said inclined conveyer and movable in descending direction along said upper descending branch, each ingot mould consisting of a bottom having an upper moulding surface and an opposed lower external surface, two longitudinal sidewalls associated with said bottom and extending parallel to the direction of descent of said ingot moulds along the upper descending branch and a single transverse wall adjoining said sidewalls and bottom, said single transverse wall extending normal to the direction of movement of said ingot moulds along said upper descending branch and each transverse wall being shaped to define at least one opening within said transverse wall and extending through said transverse wall, said single transverse wall including an internal moulding surface cooperating with said adjoining side walls and the upper moulding surface of said bottom to define a portion of said open top ingot mould cavity, and an external surface adapted to cooperate with an adjacent ingot mould along said upper descending branch to define an open top ingot mound cavity: said ingot moulds being arranged along said upper descending branch to provide a series of open top ingot moulds and cooperating to define a series of ingot mould cavities which are in communication with one another by said openings within the transverse walls of adjacent ingot moulds; means for feeding metal to said open top ingot moulds being arranged along said upper descending branch and a cooled plate disposed above said series of open top ingot moulds and downwardly along the upper descending branch relative to said means for feeding metal to sequentially close the ingot moulds as they pass beneath the cooled plate.

4,287,937

CONTINUOUS LUBRICATION CASTING MOLDS

Michael J. Pryor, Woodbridge, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 15, 1979, Ser. No. 84,768
Int. Cl.³ B22D *11/07*
U.S. Cl. 164—418 **23 Claims**



1. A casting apparatus for continuously casting molten metals or alloys comprising:

a continuous lubrication casting mold, said casting mold including a permeable casting mold section defining an inner casting surface and an outer lubricant receiving surface extending over substantially the entire length of said casting mold section;

said permeable casting mold section comprising a porous body having a continuous open pore fraction associated therewith for establishing passages for said lubricant; and

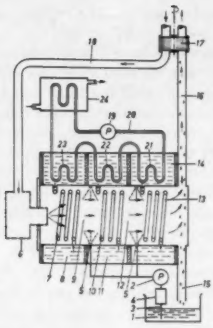
means for supplying said lubricant to said outer lubricant receiving surface comprising at least one chamber extending along substantially the entire length of said outer lubricant receiving surface;

whereby lubricant continuously transfers onto said inner casting surface along substantially the entire length thereof.

4,287,938
METHOD FOR EXCHANGING HEAT AND A DEVICE FOR CARRYING OUT SAID METHOD

Sven G. R. Lagerquist, Göingevägen 1, and Yngve R. Kihlberg, Ingelstadsvägen 47, both of 230 47 Akarp, Sweden

Filed Sep. 7, 1979, Ser. No. 73,427
Claims priority, application Sweden, Sep. 14, 1978, 7809801
Int. Cl.³ F24F *3/14;* **F28D** *15/00;* **F02M** *23/14*
U.S. Cl. 165—3 **1 Claim**



1. A method of exchanging heat comprising the steps of establishing a heat source comprising a first flow of combustion gases from combustion of fossil fuel with air from a burner at a temperature high enough to vaporize water, establishing heat utilization means comprising a second flow through piping of a heat absorbing medium through the combustion gases, passing the combustion gases of said first flow through a chamber from a higher temperature to a lower temperature part, spraying into said chamber in said first flow at a position on the lower temperature side of said flow from said piping a volatile medium in liquid phase having a high coefficient of evaporation and a low boiling point—e.g. water—at least at said higher temperature part of the first flow path so that the medium is caused to vaporize and the vapours of said volatile medium flow toward said lower temperature part of the first flow path with the combustion gases and are thereat caused to condense in said lower temperature part, whereby the heat exchange between said first and second flow is made more efficient and requires less maintenance by removing with the medium soot and other materials tending to form deposits on said piping, characterized in that the combustion gases cooled in the low temperature part carrying moisture from said evaporation are used for regenerative preheating and humidifying of the air introduced to said burner for combustion, wherein said first flow is divided into a plurality of zones where the first flow has different temperatures, and wherein each zone is provided with separate piping of heat absorbing medium at different temperatures, said method further including the step of surrounding the first flow path of combustion gases with a ring shaped reservoir containing a cooling liquid.

4,287,939
AIR CONDITIONING CONTROL SYSTEM WITH LOCAL AND REMOTE CONTROL CAPABILITIES

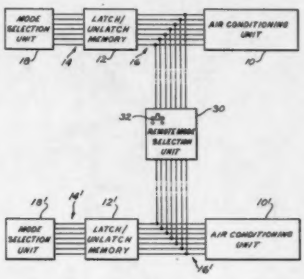
Walter J. Pohl, Louisville, Ky., and Arthur L. Burns, North Syracuse, N.Y., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 21, 1980, Ser. No. 180,216
Int. Cl.³ G05D *23/00;* **H04Q** *9/02*
U.S. Cl. 165—11 R **7 Claims**

1. A control system for an air conditioning unit having a plurality of operational modes, said control system comprising:

mode selection memory circuitry capable of storing and unstoring representations corresponding to each of the operational modes, said memory circuitry having mode selection inputs responsive to momentary actuations and operable when a particular actuation occurs to store the representation corresponding to the particular selected mode and to unstore any other representations;

an operative connection between said memory circuitry and the air conditioning unit to effect operation of the air conditioning unit in the mode corresponding to any particular stored representation;



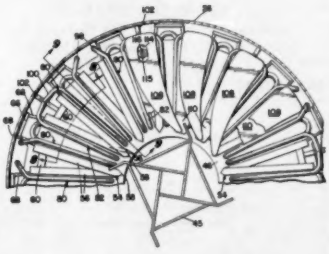
a relatively local mode selection unit including a plurality of momentarily actuable switching elements connected to said mode selection inputs; and

a relatively remote mode selection unit including at least one momentarily actuable switching element additionally connected to said mode selection memory circuitry for selecting at least one particular mode.

4,287,940
COOLING APPARATUS FOR DIFFUSERS

Robert L. Corbett, Jr., 22732 Lake Rd., Rocky River, Ohio 44116

Filed Jun. 20, 1979, Ser. No. 50,168
Int. Cl.³ C21D *9/673;* **F27D** *9/00*
U.S. Cl. 165—48 R **19 Claims**



1. A diffuser, adapted for transmitting thermal energy by conduction across metallic members and convection of a heat-treating gas in an annealing furnace, comprising:

(a) a diffuser member having a generally annular shape defined by inner and outer peripheries, said diffuser member comprising:

(i) a plurality of vertical radial walls for supporting a load plate;

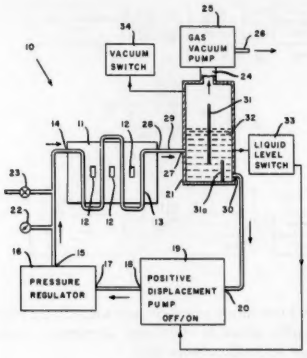
(ii) a plurality of radial gas flow passages, each being bounded on opposite sides by one of said radial walls, for directing gas along a substantially radial path;

(b) a cooling subassembly disposed in each of said radial passages, said subassembly comprising at least one radial cooling fluid leg extending substantially the length of each radial passage and having an upper and lower run, each of substantial length through the radial passage having a longitudinal axis extending in the direction of gas flow.

4,287,941
PLASTIC MOLD NEGATIVE PRESSURE COOLING SYSTEM

Paul E. Allen, Newtown, Conn., assignor to Logic Devices, Inc., Bethel, Conn.

Filed Oct. 1, 1979, Ser. No. 80,631
Int. Cl.[3] F28D *15/00*; B29F *1/08*
U.S. Cl. 165—70 7 Claims

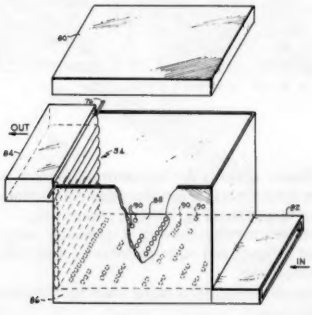


1. A system for transferring heat between a plastic injection mold and a transfer liquid with the mold having a liquid passageway having an inlet and an outlet, a closed reservoir for transfer liquid having an inlet and an outlet, means for maintaining the interior of the reservoir at a high vacuum, means connecting the outlet of the liquid passageway to the inlet of the reservoir, and a pump means having an inlet connected to the outlet of the reservoir and an outlet connected to the inlet of the liquid passageway with said pump means producing a higher vacuum at its inlet than the high vacuum maintained in the interior of the reservoir.

4,287,942
HEAT STORAGE APPARATUS

William C. Whitman, 3 Fourth St., New Brunswick, N.J. 08901

Filed Jun. 30, 1978, Ser. No. 920,962
Int. Cl.[3] F28D *13/00*; F24M *7/00*
U.S. Cl. 165—104.14 6 Claims

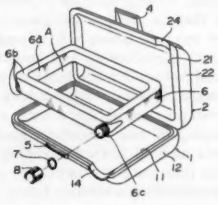


1. Storage apparatus for thermal energy comprising
a housing,
inlet and outlet means in said housing directing a flow of fluid, for use in performing a heat transfer operation, along a path through said housing,
a plurality of thermal storage assemblies disposed in a series adjacent to each other and generally parallel to each other and positioned so that fluid flows from said inlet means to said outlet means between and along said storage assemblies, said storage assemblies being adapted to take part in a transfer of thermal energy with said fluid,
each storage assembly comprising a sheet-like member formed with a plurality of parallel, elongated, generally tubular pockets containing a chemical substance which can store and give up thermal energy, said pockets forming a plurality of parallel curved corrugations spaced apart along the length of and in the outer surfaces of said sheet-like member, said pockets being disposed generally transverse to said path of fluid flow through said housing,
said storage assemblies being positioned, with respect to each other, so that the pockets of one sheet-like member are aligned generally with the space in the adjacent sheet-like member which is present between the pockets thereof so that a serpentine path is formed by the tubular pockets of one member and the spaces between the pockets of the adjacent member,
said pockets and spaces causing said fluid to flow along said serpentine path between said sheet-like members, the tubular pockets of one member directing the fluid into the spaces between the tubular pockets of the adjacent member, so that static layers of fluid cannot form along said sheet-like members and cannot reduce the efficiency of the heat transfer process between the fluid and the material in said pockets,
said fluid flowing continually in the same direction along said serpentine path from said inlet means to said outlet means and thus facilitating said heat transfer process.

4,287,943
HEAT INSULATING BOX

Masashi Hotta, Osaka, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Jun. 28, 1979, Ser. No. 52,735
Claims priority, application Japan, Jul. 5, 1978, 53-93314; Jul. 5, 1978, 53-93315
Int. Cl.[3] F28D *21/00*; F25D *3/08*
U.S. Cl. 165—104.19 4 Claims



1. An insulating box comprising a box body having an opening, a lid hingedly supported to said box body for closing said opening to form a space between said lid and said box body, releasable means for retaining said lid closed over said opening, and a radiator housed within said space, said box body and lid having an adiabatic construction, said radiator being smaller in size than said space so that when said radiator is housed within said space, a temperature retention space is defined by said radiator, box body and lid for keeping objects therein at a constant temperature, said radiator comprising a hollow and sealed container of heat resistant material having an intake for liquid and a cap closing said intake, and having a frame-like shape encircling said temperature retention space, said radiator intake projecting through an opening of said box body such that said cap is accessable from the exterior of said body.

4,287,944

HEAT EXCHANGER FOR COOLING PROCESS GASES WHICH ARE UNDER HIGH PRESSURE AND TEMPERATURE

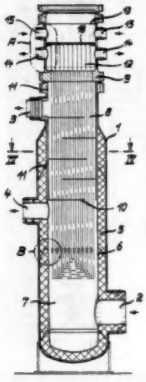
Jörgen Becker, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

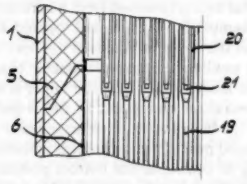
Filed Feb. 1, 1979, Ser. No. 8,796

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1978, 2804187

Int. Cl.[3] F28F 9/02

U.S. Cl. 165—158 2 Claims





1. A heat exchanger for cooling process gases which are under high pressure and high temperature, with withdrawn heat being used for high pressure steam generation in accordance with natural circulation principles to influence cooling medium flow, said heat exchanger comprising in combination:

a housing having at least one process gas inlet and at least one process gas outlet;

a tube sheet extending across the inside of said housing separating the housing into a process gas plenum and a coolant gas plenum above the process gas plenum;

the coolant plenum being divided into two chambers by said tube sheet, said chambers being separated from one another to provide a first chamber for inlet coolant-steam and a second chamber below the first chamber for outlet coolant-steam in order to provide coolant-steam circulation; and

a U-tube bundle suspended on said tube sheet in said housing and extending into the process gas plenum from the coolant plenum, each U-tube of said U-tube bundle having the upper portion of a first leg of the "U" at least some of said tubes being in the form of a double tube having an inner tube surrounded by an annular conduit, the inner tube being in open communication with the first chamber and the annular conduit being an open communication with the second chamber, the remaining portion of said first leg continuing as a single tube through the bight of said U-tube and into a second leg thereof which second leg opens into the second chamber, whereby said inner tube has the function of a gravity tube for delivering coolant steam into the U-tube whereby said annular conduit and said single tube have the function of risers constructively arranged to maintain U-tube guidance of cooling medium flow so that by application of natural circulation principles cooling- medium-circulation instabilities are avoided during starting phases and during pressure fluctuations.

4,287,945

PLATE HEAT EXCHANGER

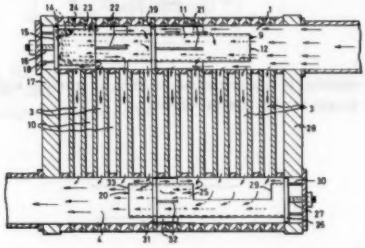
Manouchahr F. Hessari, Brighton, England, assignor to The A.P.V. Company Limited, Crawley, England

Filed Jun. 26, 1980, Ser. No. 163,349

Claims priority, application United Kingdom, Jul. 3, 1979, 23178/79

Int. Cl.[3] F28D 9/00; F28F 9/22

U.S. Cl. 165—167 16 Claims



1. In a plate heat exchanger comprising a pack of plates arranged in spaced face to face relationship to define flow spaces between adjacent plates, the plates having aligned holes therein which form ducts for the supply and discharge of media to and from the flow spaces, the arrangement of the ducts for at least one medium being of asymmetric or Z arrangement with the supply and discharge ducts being fed from and discharged to opposite ends of the pack; the improvement that an insert is provided in the supply duct for the said at least one medium to assist in distribution of the medium along the pack of plates by inhibiting the flow to the flow spaces near the end of the pack remote from the inlet end of the supply duct.

4,287,946

FORMATION TESTERS

Emmet F. Brieger, Bonito Rte., Nogal, N. Mex. 88341

Division of Ser. No. 908,579, May 22, 1978, Pat. No. 4,210,018. This application Aug. 9, 1979, Ser. No. 65,166

Int. Cl.[3] E21B 49/00

U.S. Cl. 166—100 13 Claims

1. A formation tester adapted for passage through a well bore traversing earth formations and comprising:

an elongated tool body adapted for passage through a well bore;

shoe and pad means on said tool body adapted for lateral movement relative to said tool body between a retracted position and an extended position in engagement with the wall of a well bore;

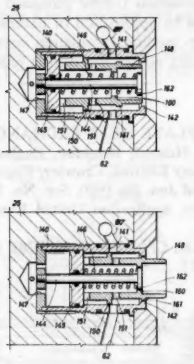
a tubular member slidably disposed in said pad means, said tubular member having an actuating piston which can be placed into access to well pressure thereby to move said tubular member between a retracted position and an extended position,

spring means in said pad means normally urging said tubular member toward its retracted position;

said tubular member having a central opening adapted to receive a fluid sample,

said pad means and tubular member cooperating when said tubular member is in an extended position to restrict the

size of said central opening to form an annular clearance space for bridging sand particles, and when said tubular



member is in a retracted position, to provide unrestricted access to said central opening.

4,287,947

SOLAR PANEL ELEMENTS AND METHOD OF MANUFACTURE THEREOF

Edgar D. Oppenheimer, Mamaroneck, N.Y.; Humfrey N. Udall, Darien, and Wallace C. Rudd, New Canaan, both of Conn., assignors to Thermatool Corp., Stamford, Conn.

Filed Apr. 23, 1980, Ser. No. 142,966
Int. Cl.³ F28F *1/20*
U.S. Cl. 165—183 **3 Claims**

1. A heat exchanger element comprising metal tubing substantially continuously secured along its length to a metal strip which is wide relative to the cross-sectional dimension of said tubing and which is thin relative to its width, said tubing being secured to said strip by metal of at least one of said tubing and said strip which has been melted and cooled to form a cast weld between said tubing and said strip, said cast weld being formed by at least two similarly shaped, continuous and discrete volumes of weld metal per inch of the tubing length, each of which volumes has a first end and an opposite second end, the first end of one volume commencing at the second end of the next adjacent volume and the longitudinal cross-sectional dimension of the weld metal at the first end of a volume being substantially greater than the cross-sectional dimension of the weld metal at the second end of said last-mentioned volume, whereby the strength of the weld at the first end of each volume is substantially greater than the strength of the weld at the second end thereof and at the second end of the next adjacent volume, so that the strength of said weld varies in the longitudinal direction of said tubing at a rate of at least two times per inch of the tubing length and said tubing is secured to said strip by welds of greater strength separated by welds of lesser strength.

4,287,948

TUBULAR MEMBER INTERIOR WIPER

Archie K. Haggard, Houston, Tex., assignor to Haggard I. D. Wiper, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 25,302, Mar. 30, 1979, abandoned. This application Sep. 13, 1979, Ser. No. 74,843
Int. Cl.³ E21B *37/02*
U.S. Cl. 166—170 **8 Claims**

1. A wiper for wiping liquids from the interior walls of a bore of a member as it is removed from a bore hole comprising,

a buoyant chamber having a closed top and a bottom effective to float the wiper in liquids in the bore of the member and being smaller in external diameter than the smallest bore of the member in which the wiper is to be used,

a flexible centralizer connected to the wiper adjacent the bottom of the buoyant chamber arranged to permit movement of liquid past it, the centralizer extending outwardly sufficiently to centralize the bottom portion of the wiper in the bore of the member and flexible enough to readily pass through the smallest bore of the member,

a mandrel yieldingly connected to and extending upwardly from the buoyant chamber,

first and second flexible wipers provided with drain openings through them, the wipers extending outwardly far enough to engage and arranged to circumferentially wipe the largest bore and flexible enough to readily retract to pass through and circumferentially wipe the smallest bore of the member,

means securing the first and second wipers to the mandrel,

the first and second wipers being axially spaced from one another a distance sufficient to permit ready passage through the smallest bore of the member and to centralize the wiper's upper portion in the bore of the member,

whereby the wiper floats in the liquid in the bore with the first and second wipers above the liquid, and as the member is removed from the well bore, the first and second wipers wipe the bore of the member of liquid and any of the liquid above the wipers drains through the drainholes,

and means for equalizing pressure within the buoyant chamber with pressure in the well bore comprising an open passageway extending into a lower portion of the buoyant chamber,

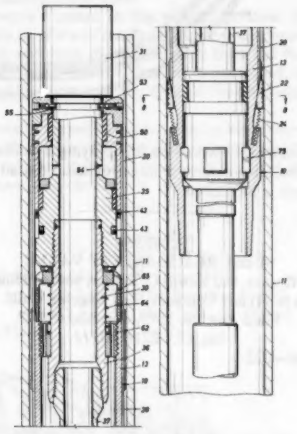
the bouyant chamber, the flexible centralizer, the mandrel and the first and second wipers formed of material which will not cause an explosion of an explosive mixture when rubbing or striking the interior walls of the member.

4,287,949

SETTING TOOLS AND LINER HANGER ASSEMBLY

Hiram E. Lindsey, Jr., Midland, Tex., assignor to MWL Tool and Supply Company, Midland, Tex.

Filed Jan. 7, 1980, Ser. No. 109,979
Int. Cl.[3] E21B *23/04*
U.S. Cl. 166—212 12 Claims



9. A liner hanger for use in hanging tubular liners a well bore comprising;

an elongated tubular body member having

(i) an internally threaded portion at its upper end for releasably coupling to a setting tool,

(ii) an external threaded portion at its lower end for coupling to a tubular liner,

(iii) an integral monolithic solid wall surface between said upper and lower ends,

(iv) a longitudinally extending internal sealing bore portion between said upper and lower ends, said bore portion having a polished portion for slidably and sealingly receiving a tubing string having a sealing member for establishing a sealing relationship within said polished bore portion,

(v) an internal recessed portion below said sealing bore portion, said recessed portion being sized and adapted for receiving locking means, and

(vi) externally located slip means for engaging the wall of a pipe and preventing downward movement of said body member in a pipe.

4,287,950

GAS PRE-INJECTION FOR CHEMICALLY ENHANCED OIL RECOVERY

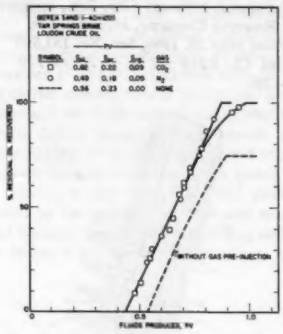
Edward G. Baker, Berkeley Heights, and John S. Huang, East Brunswick, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 3, 1980, Ser. No. 136,937
Int. Cl.[3] E21B *43/22, 33/13*
U.S. Cl. 166—273 10 Claims

1. A process for the chemically enhanced recovery of oil from an oil-bearing formation which consists essentially of the steps of

injecting nitrogen, flue gas or exhaust gas into the formation in an amount sufficient to attain trapped gas phase saturation,

injecting a fluid containing an effective amount of surfactant to displace oil,



driving the fluid through the formation with an aqueous pusher, and

recovering the displaced oil.

4,287,951

PROCESS FOR IMPROVING CONFORMANCE AND FLOW PROFILES IN A SUBTERRANEAN SANDSTONE FORMATION

R. D. Sydansk, Littleton, Colo., and P. R. Gucwa, Houston, Tex., assignors to Marathon Oil Company, Findlay, Ohio

Filed Jun. 30, 1980, Ser. No. 164,619
Int. Cl.[3] E21B *33/38, 43/22*
U.S. Cl. 166—281 18 Claims

1. A process for improving vertical conformance and flow profiles of fluids injected into or produced from a subterranean sandstone formation having at least one zone of relatively high permeability and at least one zone of relatively low permeability, the formation being penetrated by a well bore in fluid communication therewith and having a near well bore environment which exhibits relatively homogeneous horizontal properties, the process comprising:

injecting into said near well bore environment via said well bore a caustic aqueous solution, having caustic dissolved therein;

shutting in said well bore for a period of time sufficient to allow said caustic to interact with said sandstone formation thereby resulting in at least a portion of said caustic being held within said near well bore environment;

injecting into said near well bore environment an aqueous spacer slug; and thereafter,

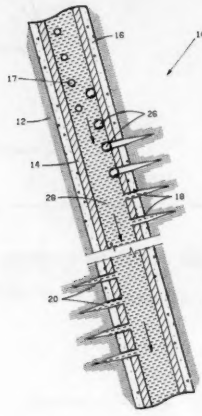
injecting into said near well bore environment via said well bore a polyvalent cation containing solution having a polyvalent cation dissolved therein that is reactive with said caustic, permitting said polyvalent cation to react with said at least a portion of said caustic to form an insoluble precipitate preferentially and predominantly within said at least one zone of relatively high permeability in said near well bore environment of the formation, said precipitate predominantly and preferentially reducing the permeability of said at least one zone of relatively high permeability.

4,287,952

METHOD OF SELECTIVE DIVERSION IN DEVIATED WELLBORES USING BALL SEALERS

Steven R. Erbstoesser, Missouri City, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed May 20, 1980, Ser. No. 151,567
Int. Cl.³ E21B *33/10, 43/26, 43/119*
U.S. Cl. 166—284 **11 Claims**



1. A method of selectively sealing perforations in a deviated well casing comprising the steps of:

perforating a first portion of said casing with a first plurality of perforations where substantially all of said perforations are positioned abutting a plane aligned substantially in the vertical and extending along the longitudinal axis of said casing;

perforating a second portion of said casing with a second plurality of perforations where substantially all of said perforations are circumferentially spaced-away from said plane at a distance sufficient to substantially prevent diverting agents being transported down said casing in carrier fluid in a pathway adjacent to said casing and to said plane, from seating in said perforations;

injecting into said casing a carrier fluid containing diverting agents selected from the group consisting of diverting agents having a density greater than that of the carrier fluid and diverting agents having a density less than that of the carrier fluid;

transporting said diverting agents in said carrier fluid down said casing to said first portion of said casing, and

flowing said carrier fluid into said first plurality of perforations to cause said diverting agents to selectively seat in said first plurality of perforations.

4,287,953

METHOD OF REMOVING CONDUIT FROM CURVED BOREHOLE

Raymond L. Mazza, Morgantown, W. Va., assignor to Conoco, Inc., Ponca City, Okla.

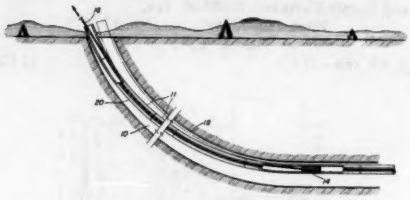
Filed Jun. 9, 1980, Ser. No. 157,909
Int. Cl.³ E21B *31/00*
U.S. Cl. 166—301 **3 Claims**

1. A method of removing a conduit from a curved borehole comprising:

(a) pumping a settable plug down said conduit to a position beyond at least a portion of the curved borehole;

(b) setting said plug against the interior of said conduit;

(c) applying a compression load to said conduit by applying tension to a cable attached to said plug; and



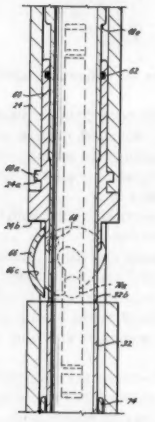
(d) simultaneously with step (c) applying a pulling force to said conduit whereby removal of said conduit from said borehole is facilitated.

4,287,954

SUBSURFACE SAFETY VALVE

William F. Krause, and Edwin C. Turner, both of Houston, Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Aug. 20, 1979, Ser. No. 68,077
Int. Cl.³ E21B *43/12*
U.S. Cl. 166—322 **2 Claims**



1. A subsurface well safety valve for use in a well flow conductor, including:

a tubular valve housing having means for securing in a well flow conductor at a subsurface location in a well, said housing having a bore formed therethrough in flow communication with the flow conductor for enabling production of hydrocarbons from the well;

a flow closure element disposed in said bore for movement to and from a first position blocking flow of fluid through said bore and a second position enabling flow through said bore;

operator means disposed in said bore for moving said flow closure element to and from the first and second positions, said operator means having a pressure responsive surface exposed to a control fluid for moving said flow closure element to the second position in response to the application of control fluid pressure to said pressure responsive surface;

urging means mounted with said tubular housing for urging said operator means to move said closure element to the first position for blocking flow of fluid through said bore;

said closure element pivotally connected to said tubular

valve housing for rotation about said pivotal connection to and from the first position and second position;

said closure element operably connected to said operator means for pivoting said closure element about said pivotal connection in response to movement of said operator means;

seat means fixed in said bore and sealingly engageable with said closure means in the first position for blocking flow of fluid through said bore;

said closure element in the second position pivoted outwardly of said seat means to enable said operator means to isolate said flow closure element from the flow of fluids wherein said closure element is protected when in the second position enabling flow of fluid through said bore; and

said operator means includes a tubular assembly reciprocally movable within said bore, said tubular assembly having a flow tube for isolating said closure element in the second position from the flow of well fluids.

4,287,955

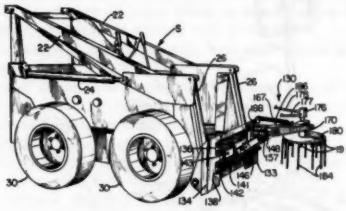
ROTARY TILLER DEVICE

Jack F. Anderson, Marion, N. Dak. 58466

Filed Jun. 7, 1979, Ser. No. 46,160

Int. Cl.³ A01B *33/06, 39/16, 59/048*

U.S. Cl. 172—98 **21 Claims**



1. In combination with a skid turn mobile vehicle that is adapted for steering by slowing, stopping, and reversing the rotation of the wheels on one side of the vehicle in relation to the wheels on the other side of the vehicle, rotary tiller apparatus, comprising:

a main support frame adapted for mounting on said vehicle;

yieldable suspension means attached to and extending laterally outward from said main support frame, the distal end of said suspension means being movable upwardly and downwardly in relation to said frame;

a rotor assembly suspended from the distal end of said suspension means, including a vertical drive shaft, a rotor member mounted on the lower end of said shaft and a plurality of resilient cultivator means attached to and extending downwardly from said rotor member in spaced-apart relation to each other, said cultivator means being resiliently flexible elongated shank members adapted for tilling the ground; and

drive means for rotating said shaft.

4,287,956

IMPACT WRENCH MECHANISM AND PIVOT CLUTCH

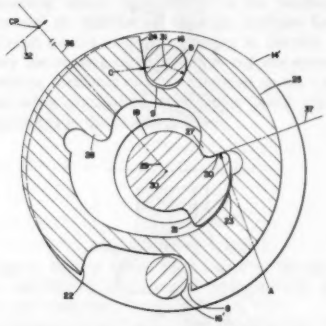
Spencer B. Maurer, 6070 Tarawood Dr., Orlando, Fla. 32811

Filed Aug. 10, 1979, Ser. No. 65,541

Int. Cl.³ B25D *15/02*

U.S. Cl. 173—93.5 **13 Claims**

1. A rotary impact tool comprising, in combination, a housing, a motor having a rotor mounted in said housing, an output shaft mounted on said housing for rotation and including impact receiving anvil jaw means generally radially disposed on its periphery, carrier member means coaxially around said output shaft and mounted for rotation in respect to said output shaft, driving connecting means between said rotor and said carrier member means for rotating said carrier member means, hammer member means pivotally connected in said carrier member means for rotation therewith and for angular pivotal motion relative thereto about an axis offset from but parallel to the axis of rotation of said carrier member means, said hammer member means for clockwise impact operation having clockwise impact delivering jaw means on its inside surface means located between 0° and 90° clockwise from its pivot connection to the carrier member means, said impact jaw means being movable into and out of the path of said impact receiving anvil jaw means to deliver impact blow(s) thereto, cam means for effecting the angular pivot movement of said impact delivering jaw means into the path of said anvil jaw means in a clockwise direction relative to said carrier member means, centrifugal force created by the proportions, mass and mass center location of said hammer member means holding said impact delivering jaw means in the path of said anvil jaw means until the



delivery of said impact blows thereto, said impact delivering jaw means being so shaped and positioned that when in forceful contact with said anvil jaw means a counterclockwise pivot torque is created acting on said hammer means tending to pivot it out of engagement with said anvil jaw means, inertia forces created by the proportions, mass and mass center location of said hammer means preventing said counterclockwise pivot motion of said hammer means until the conclusion of the impact blow;

said carrier member means comprising a front plate and a rear drive member, each having at least one hole therein, offset axially from said output shaft, and longitudinal pin means extending into said at least one hole in said front plate and rear drive member connecting said plate and member together for said carrier member means rotation and providing pivot means for said hammer member means.

4,287,957

COOLING A DRILLING TOOL COMPONENT WITH A SEPARATE FLOW STREAM OF REDUCED-TEMPERATURE GASEOUS DRILLING FLUID

Robert F. Evans, 631 Honeywood La., La Habra, Calif. 90631

Continuation-in-part of Ser. No. 153,540, May 27, 1980, which is a continuation-in-part of Ser. No. 95,532, Nov. 19, 1979, Pat. No. 4,240,674. This application Aug. 8, 1980, Ser. No. 176,338

Int. Cl.³ F21B *9/08;* **F16C** *19/34*

U.S. Cl. 175—17 **23 Claims**

1. An improved method of cooling a drilling tool component of a gaseous drilling fluid circulation drilling system, comprising the following steps:

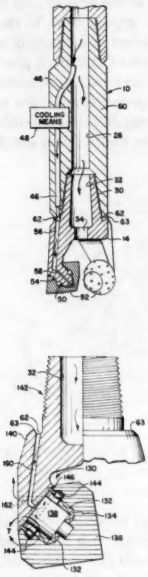
conducting a supply of pressurized drilling gas into a borehole through a drilling fluid passageway for the primary purpose of carrying particle cuttings out of the borehole,

separating in the borehole a part of the supplied drilling gas

into a flow stream separate from the remaining drilling gas in the drilling fluid passageway,

conducting the whole of the flow stream to the drilling tool component to be cooled,

passing the flow stream through a heat exchanger which is thermally separate from the drilling component to be cooled prior to conducting the flow stream to the drilling tool component to be cooled, and



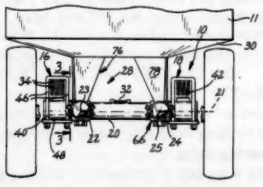
cooling the flow stream in the heat exchanger to a temperature less than the temperature of the remaining drilling gas in the drilling fluid passageway by thermally immersing the heat exchanger in a cooling stream of drilling gas separate from that of the flow stream and that in the drilling fluid passageway, the cooling stream having been reduced in temperature due to thermodynamic effects of the cooling stream drilling gas within the borehole.

4,287,958

VEHICLE SUSPENSION WITH FLEXIBLE TRANSVERSAL BEAM

Kenneth J. Schmidt, Springfield, Oreg., assignor to General Trailer Company, Inc., Springfield, Oreg.

Filed Oct. 12, 1979, Ser. No. 84,521
Int. Cl.³ G01G *19/08, 3/14*
U.S. Cl. 177—136 **4 Claims**



1. Load-measuring means in a vehicle having an elongate load bed and ground-traveling support means, said measuring means comprising

a flexible beam extending generally transversely of the longitudinal axis of said bed,

means operatively attaching said support means to said beam at a pair of spaced points thereon,

journal means mounting said bed on said beam at another pair of points spaced thereon for journaled pivoting of the beam about spaced axes generally paralleling the bed's longitudinal axis and intersecting the beam's longitudinal axis, which other points are generally symmetrical with respect to said first-mentioned pair of points, and

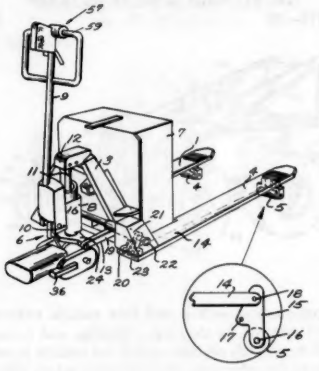
means mounted on said beam intermediate said pairs of points for monitoring beam deflection related to the weight of load carried on said bed.

4,287,959

SELF PROPELLED PALLET TRUCK

Richard Inman, 3905 Green Industrial Way, Atlanta, Ga. 30341

Division of Ser. No. 901,099, Apr. 28, 1978, abandoned. This application Feb. 23, 1979, Ser. No. 14,900
Int. Cl.³ B62D *1/14*
U.S. Cl. 180—12 **6 Claims**



1. In a pallet truck comprising means for supporting a pallet, wheels rotatably mounted on said supporting means, a drive carriage including at least two rotatably mounted wheels and means connecting said drive carriage to said supporting means, said pallet truck being supported on the wheels of said supporting means and the wheels of said drive carriage, and said wheels rotating as said pallet truck is moved;

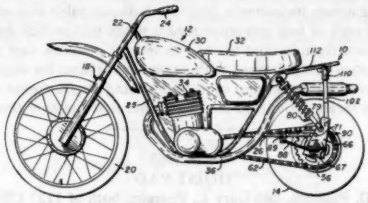
the improvement wherein said connecting means comprises a gimbal between said drive carriage and said supporting means, whereby the wheels of said drive carriage remain in contact with the floor as said pallet truck turns corners and as it moves across uneven floors, said pallet truck including drive means comprising an electric motor operatively connected to the wheels of said carriage, to propel said pallet truck, said pallet truck including a handle and switch means on said handle for actuating said drive means to propel said pallet truck, said switch means including a rotatable collar, spring means operatively connected to said rotatable collar, and a potentiometer mounted in said handle, said spring means urging said rotatable collar in a direction which stops said drive means from propelling said pallet truck, said switch means also including a lever connected to said rotatable collar, a rack and a pinion mounted to rotate the shaft of said potentiometer to control the speed of said drive means, said lever engaging said rack and said rack engaging said pinion to rotate said pinion when said rotatable collar is rotated, whereby the speed of said truck is controlled.

4,287,960

MOTORCYCLE CONVERSION KIT

Harold McConnell, Box 15, Bald Knob, Ak. 72010

Filed Sep. 28, 1979, Ser. No. 80,021
Int. Cl.³ B62K *13/04*; B62D *61/08*
U.S. Cl. 180—16 **5 Claims**



1. A kit for converting a two wheel motorcycle to three wheel operation, said kit comprising:

elongated axle means adapted to be transversely coupled to said motorcycle at the rear thereof, said axle means adapted to receive a standard drive gear associated with said two wheel motorcycle for rotation thereby;

first and second substantially planar mounting plates revolvably coupled to said axle means at spaced-apart locations thereon at opposite sides of said drive gear;

means adapted to couple said first and second mounting plates to said motorcycle;

a pair of drive hubs disposed at opposite ends of said axle means adapted to receive first and second drive wheels for propelling said motorcycle; and

stabilizer means comprising:

a horizontal member rigidly extending between said first and second mounting plates;

a vertical member rigidly attached to said horizontal member and rising upwardly therefrom; and

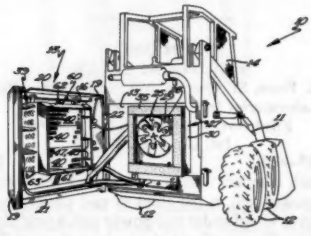
bearing means adapted to be rigidly coupled to said motorcycle at an upward location thereon for slidably receiving said vertical stabilizer member whereby vertical displacement of a suspension system of said motorcycle is facilitated while damage to said motorcycle from twisting or torsional forces is prevented.

4,287,961

VARIABLE CAPACITY RADIATOR SYSTEM FOR OFF-HIGHWAY VEHICLES

Bruce W. Steiger, Thief River Falls, Minn., assignor to Hydra-Mac, Inc., Thief River Falls, Minn.

Filed Oct. 10, 1979, Ser. No. 83,545
Int. Cl.³ B60K *11/04*
U.S. Cl. 180—68 R **5 Claims**



1. A self-propelled vehicle comprising:

a body having an engine compartment,

propulsion wheels for supporting the vehicle for travel, an internal combustion engine in said engine compartment for propelling said ground-engaging wheels, said engine being cooled during operation thereof by a liquid coolant,

a vertically disposed perforated grill housing hingedly mounted on said body for swinging movement relative thereto about a vertical axis between open and closed positions with respect to said engine compartment,

a reservoir tank mounted on the vehicle body and connected to said engine for returning cooled coolant to said engine, said reservoir tank being spaced from said grill housing,

a variable capacity radiator system for cooling heated coolant comprising a plurality of similar cooling modules, means mounting the modules in stacked relation interiorly of the rear grill housing, conduit means connecting the radiator modules with each other and with said engine to receive said coolant from the latter, conduit means interconnecting certain modules with said reservoir tank to direct cooled coolant to the reservoir tank, said module mounting means being effective for permitting ready removal or addition of radiator modules for mounted relation on the rear grill housing to thereby selectively vary the cooling capacity of the radiator system,

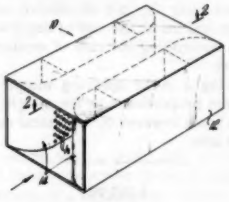
an annular yieldable member mounted on the vehicle body and being engaged by the radiator system when the grill housing is in the closed position.

4,287,962

PACKLESS SILENCER

Uno Ingard, Kittery Point, Me.; James A. Morgan, Wyckoff, N.J., and Martin Hirschorn, New York, N.Y., assignors to Industrial Acoustics Company, Bronx, N.Y.

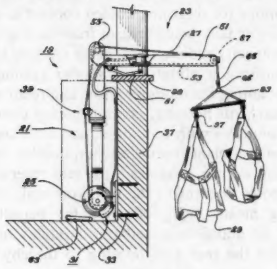
Continuation-in-part of Ser. No. 851,300, Nov. 14, 1977, abandoned. This application Apr. 17, 1979, Ser. No. 30,925
Int. Cl.³ F01N *1/08*; E04F *17/04*
U.S. Cl. 181—224 **22 Claims**



1. A packless acoustic silencer for use in a duct member having a pair of opposed, upstanding sidewall members, for attenuating noice associated with a fluid medium passing through said silencer comprising:

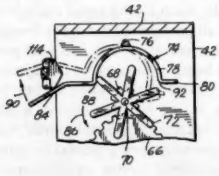
a pair of opposed, spaced apart facing panels each of which being disposed within the duct and adjacent to one of said duct sidewalls, each facing panel including a substantially flat center wall portion spaced apart from its adjacent duct sidewall and a pair of curved end wall portions, each end wall portion being connected to its adjacent duct sidewall to define a cavity within each facing panel, the space between the facing panels defining a fluid passageway bordered by each facing panel center wall portion, said center wall portions being generally parallel to one another and perforated having an open area in the range of from about 2 to 10%, said perforations each having an effective diameter in the range of from about 0.032 inch to 0.125 inch respectively for facing panels having a thickness of from about 26 gauge to 11 gauge, each of the duct sidewalls and facing panel end walls being acoustically opaque and impervious to the fluid such that there is no net flow of the fluid through said facing panels.

4,287,963
SAFETY APPARATUS
Darrell W. Coxsey, Rte. 2, Pilot Point, Tex. 76258
Filed Jan. 21, 1980, Ser. No. 113,976
Int. Cl.³ A62B 1/12
U.S. Cl. 182—231 **5 Claims**



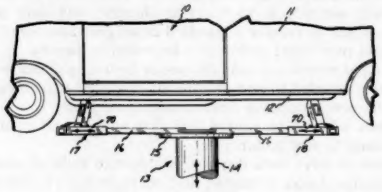
1. Safety window apparatus for lowering at least one person from a window of a hotel room or the like comprising:
a. structural framework disposed and affixed interiorly of the room and disposed adjacent the window;
b. extensible arm pivotally connected at its first end with said structural framework and having a free end that is pivotally moveable exteriorly of said window;
c. rotatable drum journalled in said structural framework for rotating and controllably playing out a lineal member for lowering the person;
d. lineal member disposed about and connected with said rotatable drum means;
e. at least one sheave mounted at the free end of said arm and having said lineal member traversing thereover;
f. body harness means for holding said person, said body harness means being connected with said lineal member; and
g. means controlling the rate of rotation of said rotatable drum means and hence the rate of descent of said person; said means controlling the rate of rotation comprising a brake means;
said arm having a brake applying means for applying a braking force proportional to the weight of said at least one person being lowered by said lineal member from the end of said arm.

4,287,964
TIMER
Edward Sollenberger, Triadelphia, W. Va., assignor to Empire of Carolina, Inc., New York, N.Y.
Filed Feb. 9, 1979, Ser. No. 10,863
Int. Cl.³ F03G 1/00
U.S. Cl. 185—38 **4 Claims**



1. A timer comprising: a housing, a spring-powered mechanical motor means mounted in said housing, said motor means including spring means and step up gear train means driven by said spring means for advancement during the relaxation of the tension in the spring means, switch means manually manipulatable from outside of said housing, said switch means being displaceable between a first position at which said switch means stops the advancement of said motor driven means and a second position at which said switch means permits said motor to advance, and speed governor means coupled to said gear train means for regulating the speed of rotation of said gear train means, said speed governor means being reciprocally oscillatable along a path by said gear train means, said switch means including a projection displaceable into and out of the path of said governor means when said switch means is displaced from its first toward its second position, said switch projection being formed with camming surfaces for displacing said governor means out of its path during displacement of said switch means from said second to said first position thereof.

4,287,965
HOIST PAD
Alan D. Pearson, and Gary L. Pearson, both of 1127 Cliff Rd., Burnsville, Minn. 55337
Filed Oct. 15, 1979, Ser. No. 84,799
Int. Cl.³ B60S 13/00
U.S. Cl. 187—8.75 **36 Claims**

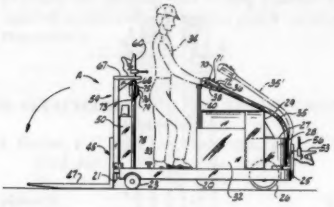


1. A hoist pad useable with a lift arm of a hoist to support a part of a load comprising: frame means mountable on a lift arm, a base supported on the frame means, said base including side pockets, means attaching the base to the frame means, and a lift assembly mounted on the base and engageable with a load to support a part of the load on the hoist pad, said lift assembly having a first member movably mounted on the base, said first member including means located in said side pockets to movably mount the first member on the base, said first member and base having first cooperating means which permit the first member to be located in separate locations relative to the frame means, said first cooperating means including a plurality of transverse grooves located at different elevations in said base, said first member having a rib selectively locatable in one of said grooves to locate the first member in a selected position relative to the base, and a second member movably mounted on the first member, said first and second members having second cooperating means selectively locating the second member in a first down position and a second up position whereby the first and second members can be positioned relative to each other to change the effective lifting height of the hoist pad.

4,287,966
INDUSTRIAL TRUCK
Kenneth A. Frees, St. Charles, Mo., assignor to Missouri Research Laboratories Inc., St. Charles, Mo.
Filed Nov. 6, 1978, Ser. No. 958,166
Int. Cl.³ B66B 9/20
U.S. Cl. 187—9 R **22 Claims**

1. A small, compact industrial fork lift truck comprising a chassis, a power unit at the front of said chassis including a steerable drive wheel under said power unit, a pair of nonsteerable wheels at the rear of said chassis, a platform at the rear of said chassis for standing of an operator while operating said truck, said platform being rearward of said power unit, a steering control interconnected with said drive wheel and accessible by said operator, said steering control comprising a steering arm extending from said power unit toward said platform, said

power unit comprising a motor and drive wheel unit mounted for rotation about an axis vertical to said chassis, said steering arm being swingable about said axis for steering said drive wheel, a fork lift assembly carried at the rear of said chassis having a pair of forks extending rearwardly from said chassis for lifting palletized loads, fork actuation means for selectively raising and lowering said forks, coupler means carried at least at one end of said chassis for coupling a trailer to said truck independently of said fork lift assembly, and control means accessible to said operator from said platform for controlling



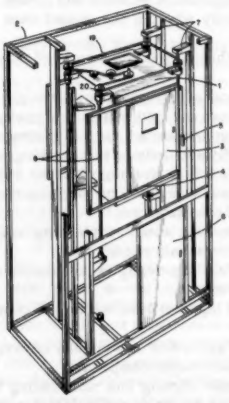
movement of said truck and raising and lowering of said forks, said control means comprising first and second sets of controls each adapted for operating said fork actuation means to control raising or lowering movement of said forks, said first set of controls being carried by said arm and said second set of controls being carried at the rear of said truck for accessibility when said operator faces rearwardly on said platform, and a high speed control accessible only at said platform and operable by said operator when standing upon said platform for effecting high speed movement of said truck.

4,287,967

SELF-SUPPORTING AND SELF-CONTAINED ELEVATOR

Rex H. Perkins, Victoria, Australia, assignor to Sanscord Australia Pty. Limited, Victoria, Australia

Filed Jun. 8, 1979, Ser. No. 46,948
Int. Cl.³ B66B *11/04*
U.S. Cl. 187—24 **6 Claims**



1. Self-supporting and self-contained apparatus capable of being preassembled and placed into an existing well or space provided in a structure, said apparatus being for the transfer of loads between vertically spaced-apart levels of a structure, said apparatus including

(a) support frame means;

(b) platform means for supporting a load, said platform means being accessible from one side thereof or from two sides thereof, said two sides being opposite to each other;

(c) guide means extending between said levels and rigidly affixed to said support frame means to constitute a path for movement of said platform means between said levels; said guide means including at least two elongated, stationary screws, each of said screws being threaded within a revolving circulating ball nut; each ball nut being fixed to a sleeve formed with a central bore having a diameter greater than the screw thickness, to maintain said screw and said sleeve spaced apart from each other; each of said sleeves being attached to a sprocket and being supported within a bearing means, said bearing means being rigidly connected to said platform means; and

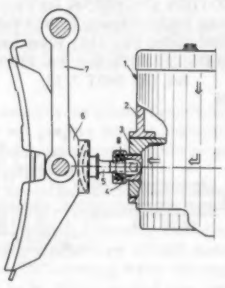
(d) drive means associated with said platform means and operable to simultaneously drive each of said sprockets and thereby cause each ball nut to revolve around the respective stationary screw whereby movement is imparted to said platform means.

4,287,968

DEVICE AT A BRAKE ACTUATOR

Bo G. Stensson, Teckomatorp; Jan O. Harström, Malmö, and Jan Csiba, Paarp, all of Sweden, assignors to SAB Industri AB, Landskrona, Sweden

Filed Oct. 16, 1979, Ser. No. 85,285
Claims priority, application Sweden, Nov. 2, 1978, 7811340
Int. Cl.³ F16D *49/00*
U.S. Cl. 188—74 **1 Claim**



1. A braking system with a brake shoe movable along an arcuate path and thereby operable in the presence of substantial lateral movement of a brake block holder comprising in combination,

said brake block holder in said arcuate path adapted to move a brake shoe into contact with a rotating surface along a movement line and thereby having a degree of motion lateral to a linear movement line,

a push rod having a linear movement path,

means actuating the push rod in a substantially linear back and forth direction along said linear movement line for actuating the brakes by moving said brake shoe in and out of said contact,

a transmission part substantially disposed along said linear movement line between said brake block holder and push rod to move substantially along the linear movement line comprising a transmission rod having a longitudinal axis diposed in a neutral position along said linear movement line with spherical surfaces of differing diameters disposed on opposite ends thereof to engage respectively the brake block holder at a substantially flat surface and the push rod in a cup shaped surface to coact therewith to permit an angular departure of the order of 3° to 4° from said neutral position relative to the push rod, the radius of the spherical surface in contact with the brake block holder being substantially larger than that of the spherical surface

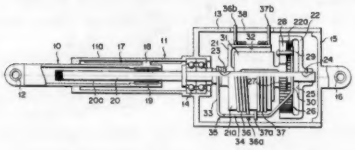
in contact with the push rod thereby to reduce the forces exerted on the push rod perpendicular to said linear movement path when the brake shoe moves along said arcuate path, wherein the respective spherical surfaces are in substantially unconfined movable surface contact with the flat and cup shaped surfaces and have a common center thereby eliminating slippage between the spherical surfaces with the respective block holder and push rod surfaces, and rotation prevention means comprising members engaging the push rod, the brake block holder and the transmission part thereby holding the transmission rod non-rotational about its axis whereby the brake block holder upon actuation of the push rod moves the brake shoes into contact with the rotating surface in the presence of said lateral motion without imparting a rotational movement to the push rod.

4,287,969

MOTION SNUBBING DEVICE

Atsushi Misumi, and Yoshio Kimura, both of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Dec. 21, 1979, Ser. No. 105,930
Int. Cl.³ B60T 7/12
U.S. Cl. 188—134 **7 Claims**



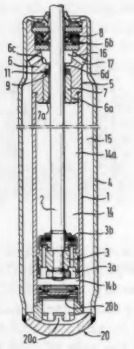
1. A motion snubbing device comprising:
a pair of telescoping support members mounted to reciprocate on each other along the axial direction thereof, while being restrained from relative rotation, when any force is applied from the outside;
means for converting the axial movement of one of the paired support members into a rotation moment;
a shaft supported by the other member to be rotated by said moment converting means;
an inertia member rotatable relatively to said shaft;
a planetary gearing mechanism interposed between said shaft and inertia member, said planetary gearing mechanism rotating on its own axis to rotate said inertia member with said shaft when gentle external force is applied;
a brake member mounted on said shaft and having a brake surface;
clutch spring means disposed around said brake surface and normally in a stationary state where said clutch spring means is disengaged from said brake surface; and
actuating means disposed between said planetary gearing mechanism and clutch spring means, said actuating means being operated by said planetary gearing mechanism to revolve when drastic external force is applied and applying initial force to said clutch spring means for clutch engagement with said brake surface, whereby said shaft is prevented from rotation.

4,287,970

HYDRO-PNEUMATIC DAMPING DEVICE

Robert Eusemann, Bergrheinfeld; Günther Handke, Euerbach, and Manfred Koller, Bergrheinfeld, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jan. 25, 1980, Ser. No. 115,500
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2905928
Int. Cl.³ F16F 9/06
U.S. Cl. 188—269 **15 Claims**



1. A hydro-pneumatic damping device comprising
(a) an inner cylinder having an axis and two ends,
(b) a central cavity defined within said inner cylinder between said two ends,
(c) an outer container surrounding said inner cylinder, said outer container having two ends adjacent respective ends of said inner cylinder,
(d) an annular cavity defined between said inner cylinder and said outer container,
(e) first and second closure means closing said two ends of said cylinder and said container,
(f) piston rod passage means through the first ones of said closure means,
(g) fluid passage means between said central cavity and said annular cavity adjacent the second ones of said closure means,
(h) first fluid throttling means associated to said fluid passage means,
(i) a piston rod axially extending through said piston rod passage means and into said central cavity,
(k) a piston unit mounted on said piston rod within said central cavity and defining two working chambers within said cavity, a first working chamber adjacent said first closure means and a second working chamber adjacent said second closure means,
(l) fluid connecting means connecting said two working chambers across said piston unit,
(m) second fluid throtteling means associated to said fluid connecting means,
(n) a body of liquid at least within the central one of said cavities,
(o) a body of gas within said annular cavity,
said first closure means comprising
(aa) a cylinder closing unit surrounding said piston rod and having an inner end adjacent said first working chamber and an outer end,
(bb) a sealing unit engaging said piston rod and having an inner end adjacent said outer end of said cylinder closing unit,
(cc) venting passage means between said first working chamber and said annular cavity extending across said cylinder closing unit and axially inside said inner end of said sealing unit,

(dd) check valve means associated to said venting passage means permitting fluid to flow from said first working chamber toward said annular cavity and preventing reverse flow, said check valve means comprising

an annular check valve member in frictional sliding engagement with said piston rod for axial movement with said piston rod toward a sealing position during inward movement of said piston rod and toward an opening position during outward movement of said piston rod, first and second abutment means being provided for defining said sealing position and said opening position of said annular check valve member respectively.

4,287,971

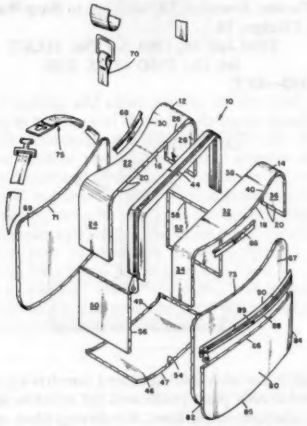
BODY-ATTACHABLE BAG FOR TRANSPORTING ARTICLES

Clayton J. Doulet, P.O. Box 220, Dandridge, Tenn. 37725

Filed Jan. 2, 1980, Ser. No. 109,154

Int. Cl.[3] **A45C** *3/10, 13/00, 13/30*

U.S. Cl. 190—48 **4 Claims**



1. A bag particularly suitable for transporting an article in a suspended position alongside of and in substantial wrapping contact with the user's body and having a reduced tendency to swing relative to such user's body during the user's walking or other movements, said bag comprising strap means of suitable length to overwrap the shoulder of a user and having its opposite ends extending downwardly from such shoulder in the direction of a user's waist, first flexible elongated panel means formed into a generally inverted U-shape with its base portion defining a substantial portion of the top of said bag and its leg portions defining substantial portions of the opposite ends of said bag, said ends of said strap being secured to respective ones of said leg portions, second elongated panel means of substantially the same length as and substantially coterminal with said first panel means but of more narrow width disposed in side-by-side relation to said first panel means with one of the side edges of said first panel means being contiguous to one of the side edges of said second panel means, said contiguous side edges being aligned along the aforesaid U-shape to define a top opening in said bag, closure means extending along said contiguous side edges and adapted to releasably join said side edges to one another, third elongated flexible panel means defining the bottom of said bag, fourth and fifth planar panel means interposed between said bottom panel and the coterminal ends of said first and second panel means, means joining each of said fourth and fifth panel means to said respective coterminal ends of said first and second panel means and said bottom panel means, first side panel means, means joining said first side panel means along its perimeter to the outboard side edges of said first, third, fourth and fifth panel means to close one side of said bag, second side panel means, means joining said second side panel means along its perimeter to the opposite side edges of second, third, fourth and fifth panel means to close the opposite side of said bag, said first panel means having one side edge which is outboard and concave with respect to the length dimension of said first panel along that portion thereof which is disposed on the top of said bag, said third panel means having one side edge which is outboard of said bag and concave with respect to the length dimension of said third panel in that portion thereof which is disposed on the bottom of said bag whereby said first side panel, when joined to said side edges as aforesaid, is caused to assume a concave geometry.

4,287,972

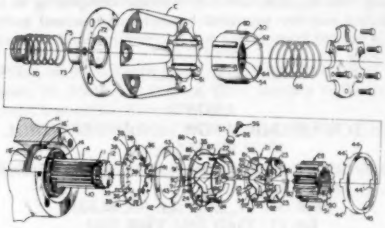
AUTOMATIC CLUTCH ASSEMBLY

Harry A. Petrak, 2565 Table Mesa Dr., Boulder, Colo. 80303

Filed Oct. 22, 1979, Ser. No. 87,025

Int. Cl.[3] **B60B** *27/00;* **F16D** *1/06, 43/20*

U.S. Cl. 192—54 **24 Claims**



1. In a clutch assembly, an actuator mechanism operative to effect releasable but positive driving engagement between a member to be rotated and a rotatable drive member, said actuator mechanism comprising:

first actuating means including a cam follower rotatable in response to positive rotation of said drive member;

second actuating means releasably locked against rotation and provided with first cam control means operative to advance said first actuating means into engagement with the member to be driven, second cam control means engageable by said first actuating means to release said second actuating means for rotation upon engagement between said first actuating means and the member to be driven, and third cam control means engageable by said first actuating means when said drive member is no longer positively rotated and the member to be driven is reversed in its direction of rotation with respect to said drive member whereby to return said second actuating means to its locked position and to disengage said first actuating means from driving engagement with the member to be driven.

4,287,973

SHIFTABLE FRICTION CLUTCH IN PARTICULAR FOR GEAR DRIVES

Johann Eichinger, Vaterstetten, and Gert Burzlauer, Anzing, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Dec. 4, 1979, Ser. No. 100,070

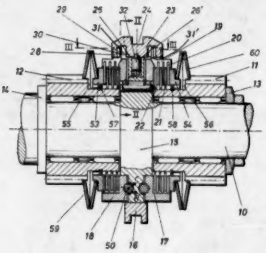
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855318

Int. Cl.[3] **F16D** *21/06, 13/42*

U.S. Cl. 192—54 **9 Claims**

1. In a shiftable friction clutch for gear drives including a shaft, a carrier having inclined first surfaces thereon, a collar which surrounds and is supported axially movably with respect to said shaft, and first and second clutch halves having

cooperable friction surfaces, said first clutch half having at least one friction ring which is axially movable with respect to said shaft and has second surfaces which are arranged on an axially facing surface thereof facing away from said clutch friction surfaces and are inclined with respect to the plane of



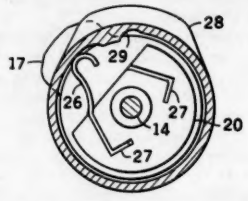
rotation of said friction ring, said first and second surfaces opposing one another, the improvement comprising at least one sliding member provided between said second inclined surfaces on said friction ring and said first inclined surfaces on said carrier.

4,287,974

CLUTCH ASSEMBLY FOR VENDING CONTROL SYSTEM

Wayne Krejci, Chesterfield, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Oct. 17, 1979, Ser. No. 85,583
Int. Cl.³ F16D 7/02; F16P 7/02
U.S. Cl. 192—56 R **1 Claim**



1. A torque-limiting clutch means and switch assembly for a vending control system including a motor for driving a load, comprising:

(a) a shaft driven by the motor,

(b) a motor cam connected to the shaft, the motor cam including:

1. a first circular end portion providing a bearing extending coaxially of the shaft,
2. a second opposite end portion, and
3. an intermediate portion extending between the first and second end portions,

(c) a load cam including a cup-shaped section open at one end and closed at the other end by a wall, and having an annular spring-bearing wall extending axially between the open end and closed end wall, the end wall being provided with a recess communicating with the interior of the cup-shaped section and rotatively receiving the said first end portion of the motor cam and providing the only rotative bearing support for the motor cam and shaft on the load cam,

(d) the said second opposite end portion and the said intermediate portion of the motor cam being received in the cup-shaped section of the load cam, the said second opposite end portion and said intermediate portion of the motor cam having a transverse dimension smaller than the cup-shaped section of the load cam to provide a peripheral space therebetween without physical engagement,

(e) a clutch spring carried by the said intermediate portion of the motor cam and engaging the annular spring-bearing wall of the cup-shaped section of the load cam for turning the load cam with the motor cam when the load torque on the load cam is less than a predetermined value, and the clutch spring slidably engaging the annular spring-bearing wall of the cup-shaped section of the load cam when the load torque is greater than the predetermined value for allowing relative rotative movement between the load cam and the motor cam, and

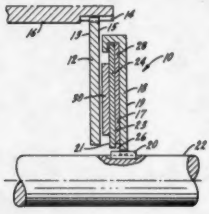
(f) the second opposite end portion of the motor cam including a transverse raised portion for actuating the switch assembly, the transverse raised portion being located outside of and spaced from the open end of the cup-shaped section of the load cam.

4,287,975

CLUTCH WITH FUSIBLE MATERIAL AS PROTECTIVE ELEMENT

John J. Tuzson, Evanston, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 16, 1980, Ser. No. 112,673
Int. Cl.³ F16D 43/25, 9/00
U.S. Cl. 192—82 T **6 Claims**



1. A clutch assembly having at least one driving plate, a first and second driven plate positioned for selective engagement with, and disengagement from, the driving plate, each of said plates having at least one face oriented toward an opposed face on another of said plates, a friction lining material affixed to one of said faces, and a meltable, fusible material interposed between said driven plates, said meltable, fusible material having a melting point such that it undergoes a transition from the solid state to the liquid state when the clutch assembly reaches a predetermined, elevated temperature, allowing the driven plate with the lining material affixed thereto to slip with respect to the second driven plate and prevent damage to the friction lining material.

4,287,976

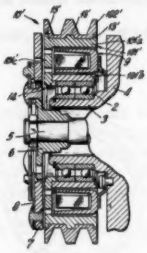
ELECTROMAGNETIC CLUTCHES

Masakatsu Sakaki, and Nobuaki Saegusa, both of Isesaki, Japan, assignors to Sankyo Electric Company Limited, Isesaki, Japan

Filed May 8, 1979, Ser. No. 37,237
Int. Cl.³ F16D 27/10; F16H 55/36
U.S. Cl. 192—84 C **3 Claims**

1. In an electromagnetic clutch which includes a first magnetic rotatable member rotatably supported on first bearing means, said first rotatable member being provided with at least one annular groove in the outer surface thereof for receiving belt means operatively connected to an external power source to be rotated by the external power source and having axial end magnetic friction surfaces, a second rotatable member rotatably supported on second bearing means, an annular magnetic member being supported on said second rotatable member so as to be capable of limited axial movement and having an

axial end surface which faces said magnetic friction surfaces of said first magnetic rotatable member with an axial gap therebetween, and electromagnetic means associated with one of said first rotatable member and said annular magnetic member for attracting the other member, the improvement comprising said first rotatable member having an annular body of magnetic material, a pulley member having said belt-receiving groove in the outer surface thereof which is formed of aluminum alloy, said pulley member being disposed on the outer surface of said annular magnetic body by casting, said annular magnetic body having an outer annular portion and an inner annular ring, an axial end annular plate portion integral with said outer annular



portion and joining said outer annular portion and said inner annular ring at an axial end thereof to define an annular hollow portion, said electromagnetic means being fixedly disposed in said annular hollow portion, said inner annular ring being joined to said axial end annular plate portion at the radial inner end, said axial end annular plate portion having said axial end magnetic friction surfaces, said axial end annular plate portion having an annular axial boss at the radial inner end thereof, said annular axial boss including an axially projecting end, said annular axial boss being fitted into and fixed to said inner annular ring, and said axially projecting end of said annular axial boss serving as a stopper for preventing axial movement of said first bearing means.

4,287,977

HYDRAULIC CLUTCH RELEASE MECHANISM

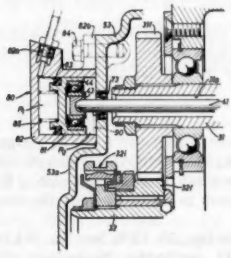
Shozi Haga, and Hisao Ootani, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 4, 1979, Ser. No. 45,054

Claims priority, application Japan, Oct. 28, 1978, 53-132989; Oct. 28, 1978, 53-132990

Int. Cl.³ F16D *25/08*

U.S. Cl. 192—91 A **6 Claims**



1. In an hydraulic release mechanism for a vehicle clutch in combination with a power transmission unit, said release mechanism comprising a push-rod axially slidable within an input shaft of said transmission unit and having one end engaged with a release member of said clutch and the other end extended outwardly from said housing assembly of said transmission unit and an hydraulic cylinder attached to said housing assembly to urge said push-rod toward said release member, causing disengagement of said clutch;

the improvement wherein a seal member is adapted to said housing assembly for surrounding the outwardly extended portion of said push-rod in a fluid tight manner, and said hydraulic cylinder includes a cylinder housing provided at its closed end with a port for connection to a source of hydraulic pressure and being detachably secured at its open end to said housing assembly to contain the outwardly extended end of said push-rod therein; a piston axially slidable within said cylinder housing and engaged with the outwardly extended end of said push-rod, said piston being provided at its outer periphery with an annular seal member to subdivide the interior of said cylinder housing into a pneumatic chamber and an hydraulic chamber in open communication with said port; and a communication passage provided between the open end of said cylinder housing and the outer wall surface of said transmission housing assembly to vent said pneumatic chamber to the atmospheric air, said communication passage having the upper end opening into the bottom portion of said pneumatic chamber and the lower end opening adjacent to an embossed portion of said housing assembly.

4,287,978

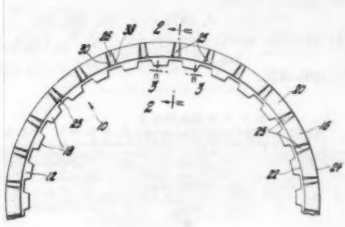
ANNULAR FRICTION DISC WITH RADIAL GROOVING

Vincent M. Staub, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1979, Ser. No. 60,798

Int. Cl.³ F16D *13/74*

U.S. Cl. 192—113 B **1 Claim**



1. A friction disc for a clutch or brake comprising; an annular disc of friction material having a radial inner periphery and a radial outer periphery, a substantially flat surface between the peripheries and a plurality of radially extending circumferentially spaced grooves formed in said flat surface and each groove having an edge at the inner periphery displaced axially from the flat surface, an edge at the outer periphery contiguous with the flat surface and spaced sidewalls disposed at an angle to the groove bottom and the flat surface.

4,287,979

METHOD AND APPARATUS FOR ASSEMBLING ROD-LIKE ARTICLES

Desmond W. Molins, and Brian H. Warner, both of London, England, assignors to Molins Limited, London, England

Filed Jul. 12, 1977, Ser. No. 815,197

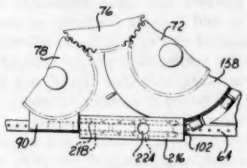
Claims priority, application United Kingdom, Jul. 22, 1976, 30534/76

Int. Cl.³ B65G *47/29*

U.S. Cl. 198—425 **11 Claims**

1. Apparatus for assembling rod-like articles, the apparatus comprising endless band conveyor means for conveying a stream of rod-like articles in an endwise direction; guide means spaced above and extending along said conveyor means, said guide means including a surface having an arcuate cross sec-

tion adapted to partly surround a plurality of articles in said stream so as to guide and align the plurality of the articles on said conveyor means, said surface having a predetermined axial length so as to extend from a leading edge of one of said articles to a trailing edge of at least one other abutting article of said plurality of articles; at least one suction outlet in said surface; and means for applying suction to said outlet in a



direction transverse to said stream to retard predetermined articles of said stream relative to said conveyor means by drawing said predetermined articles against said surface and for subsequently removing suction to release said articles after a predetermined period, so that said conveyor means conveys spaced groups of abutting articles downstream of said suction outlet.

4,287,980

DEVICE FOR DISTRIBUTING CONTAINERS INTO SEVERAL ROWS AND MACHINE USING SUCH A DEVICE

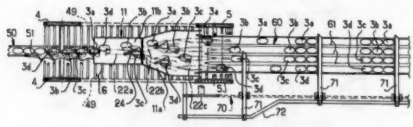
Daniel Montferme, Vernouillet, France, assignor to E. P. Remy et Cie., Dreux, France

Filed Dec. 4, 1979, Ser. No. 100,188

Claims priority, application France, Sep. 21, 1979, 79 23565

Int. Cl.³ B65G *47/30*

U.S. Cl. 198—425 **12 Claims**



1. Apparatus for distributing articles from a single line moving along a predetermined path into a plurality of adjacent lines, the apparatus comprising:

an endless conveyor extending above the predetermined path through a distributing region;

a plurality of gripper heads, each gripper head being actuable between an article engaging position and an article releasing position;

a plurality of means for mounting respective ones of said gripper heads on said conveyor for movement in longitudinally spaced relation through said distributing region, each of said mounting means providing for transverse movement of the respective gripper head relative to said path;

means for aligning each gripper head on its respective mounting means with said single line of articles prior to its entry into the distributing region;

means for actuating each gripper head to the article engaging position upon entry of said gripper head into the distributing region;

at least one branched track means arranged in the distributing region, said branched track means having a single entry and at least two transversely spaced exits, each of said gripper heads having a guiding means engageable with said branched track means;

a deflection member pivotally mounted on said track means for diverting gripper heads from said single entry alternately to said at least two exits; and

means for actuating each gripper head to the article releasing position prior to exit of said device from the distributing region.

4,287,981

COLLATING MEANS

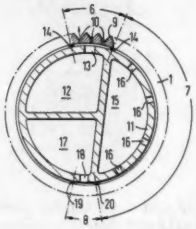
Roger A. Allen, Great Missenden; Bruce R. Inglis, Wooburn Green, and Kieron P. Green, Thame, all of England, assignors to The Wiggins Teape Group Limited, Hampshire, England

Filed Jan. 16, 1979, Ser. No. 3,819

Claims priority, application United Kingdom, Jan. 23, 1978, 02706/78

Int. Cl.³ B65G *47/26, 29/00, 17/46*

U.S. Cl. 198—457 **12 Claims**



1. An apparatus for collating a flow of rod-like elements moving in a lengthwise direction, comprising:

(a) a rotatable drum for receiving the rod-like elements and moving them transversely to their lengthwise direction from a reception zone located at the upper part of said drum to a discharge zone angularly spaced from said reception zone through a holding zone located between said reception zone and said discharge zone, said rotatable drum having a cylindrical wall upon the outer surface of which the rod-like elements are received, said cylindrical wall having means throughout the area of said cylindrical wall for permitting fluid flow through said cylindrical wall;

(b) means for supplying a fluid flow radially outwardly and upwardly through said cylindrical wall throughout the area of said reception zone to create a fluid bed at said reception zone for assisting the reception of the rod-like elements on said drum;

(c) means for supplying a fluid flow inwardly through said cylindrical wall at said holding zone whereby a vacuum is created for holding the rod-like elements on said drum; and,

(d) means for supplying a fluid flow outwardly through said cylindrical wall at said discharge zone for assisting the discharge of the rod-like elements.

4,287,982

APPARATUS FOR CONSECUTIVELY DISCHARGING OBJECTS FROM CONTAINERS

Hendrik J. Kattenbroek, and Jan Plug, both of Barneveld, Netherlands, assignors to Moba Holding Barneveld, Barneveld, Netherlands

Filed Dec. 10, 1979, Ser. No. 101,767

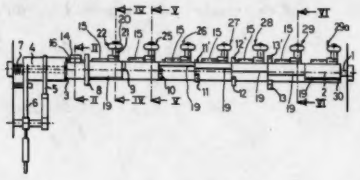
Claims priority, application Netherlands, Dec. 13, 1978, 7812116

Int. Cl.³ B65G *47/46*

U.S. Cl. 198—706 **9 Claims**

1. In an apparatus for consecutively discharging containers, a driving means for a control sleeve provided with discharge stops, which driving means contains a rotatably mounted driving member, a coupling operative to transmit a driving torque

from the driving member on the said control sleeve in one direction only, said driving member being connected to a device continuously exerting a torque on said driving member in said mentioned direction, a resetting device for rotating said driving member in the direction opposite to said mentioned



direction, a release member for said resetting device being connected to said driving member and adapted to cooperate with said resetting device to activate to rotate said driving member a predetermined angle in said opposite direction and a means for preventing said sleeve to rotate in the said opposite direction.

4,287,983

CONVEYORS HAVING A PLURALITY OF DRIVEN ENDLESS CHAINS

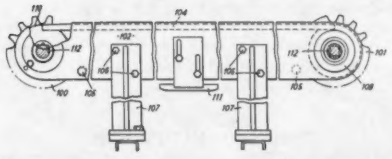
Frederik A. Bronsveld, Ijmuiden, Netherlands, assignor to Hoogovens Ijmuiden, B.V., Ijmuiden, Netherlands

Filed Jun. 15, 1979, Ser. No. 48,809

Claims priority, application Netherlands, Jun. 21, 1978, 7806685

Int. Cl.³ B65G *15/10, 21/00*

U.S. Cl. 198—817 **4 Claims**



1. In a conveyor having a plurality of endless chains arranged side-by-side and each being driven around a path having an upper and a lower run, the upper runs supporting and displacing articles being conveyed on the conveyor, each chain being composed of elements running on rollers along a roller track and there being sprocket wheels engaging the chain at each end of the upper and lower runs, the sprocket wheels of the respective chains being arranged coaxially at each end of the conveyor, a shaft passing through the sprockets at each end of the conveyor, the improvement that each said chain is mounted on a cassette, the respective cassettes being individually and independently removable from the conveyor for repair or replacement, each cassette having an elongate frame providing said roller track and carrying bearings supporting said sprocket wheels at the ends of the conveyor a fixed distance apart, said upper runs supporting and displacing articles being conveyed on the conveyor being supported only by said roller track, the sprocket wheels of the respective cassettes at one end of the conveyor being drivingly engaged by one said shaft acting as a drive shaft while the sprocket wheels at the other end of the conveyor are freely rotatable about another said shaft, said shafts being splined, said sprockets at one end of said conveyor having splined holes therethrough cooperating with said splined shaft and a D.C. electric motor directly driving and splined sprockets through said splined shaft.

4,287,984

BELT WITH PLURAL LAYERS USED IN THE AUTOMATIC DOCUMENT FEEDING APPARATUS

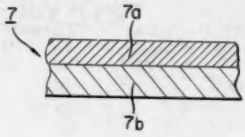
Syuzi Okamoto, and Naoto Mukai, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1980, Ser. No. 115,807

Claims priority, application Japan, Feb. 13, 1979, 54-23418[U]

Int. Cl.³ B32B *27/06, 27/32;* **E65G** *15/34*

U.S. Cl. 198—847 **4 Claims**



1. In a document feeding apparatus for use in an electrophotographic copying machine, the improvement comprising a document feeding belt having at least an internal layer and an external layer, said internal layer consisting essentially of chloroprene rubber which is flexible and has a high coefficient of friction, said external layer consisting essentially of chlorosulfonated polyethylene which is flexible, has high whiteness, and is difficult to stain.

3. In a method of feeding documents in an electrophotographic copying machine, the improvement comprising providing a document feeding belt having at least an internal layer and an external layer, said internal layer consisting essentially of chloroprene rubber which is flexible and has a high coefficient of friction, said external layer consisting essentially of chlorosulfonated polyethylene which is flexible, has high whiteness, and is difficult to stain.

4,287,985

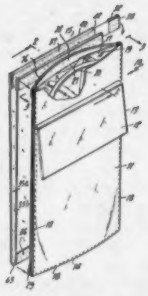
EYEGLASS CASE

Arnold R. Feniger, 415 E. 52 St., New York, N.Y. 10022

Continuation-in-part of Ser. No. 104,149, Dec. 17, 1979, abandoned. This application Jul. 17, 1980, Ser. No. 169,662

Int. Cl.³ A45C *11/04*

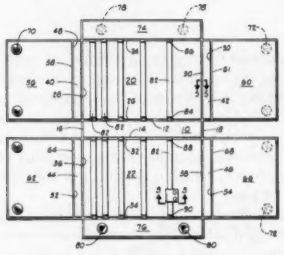
U.S. Cl. 206—5 **6 Claims**



1. An eyeglass case comprising a case being formed of flexible sides and with a pocket for receiving a pair of folded eyeglasses, a cleaning sheet attached to one side of said case, and a second cleaning sheet being attached adjacent to said first cleaning sheet and forming a second pocket therewith, said second pocket being transversely disposed to said first pocket and wherein one surface of said second sheet is facingly disposed to one surface of the first sheet, attaching means wherein said second sheet is fixedly attached to the case at the top and

bottom of the case to form said second pocket, whereby the eyeglasses may be removed from said first pocket and unfolded and the lens of the unfolded glasses inserted in said second pocket to be engaged by opposed surfaces of the cleaning sheets with the fingers in the first pocket and the thumb pressing the second sheet so that the cleaning sheets are pressed against the lens and said case being tapered so as to permit the fingers opposing the thumb to be inserted in said first pocket for cleaning the lens.

4,287,986
EARRING DISPLAY CASE
William M. Beck, 133 Barbara Dr., Edmond, Okla. 73034
Filed Sep. 13, 1979, Ser. No. 75,517
Int. Cl.³ B65D *5/50*
U.S. Cl. 206—45.19 **14 Claims**



14. A display case comprising:

a substantially rectangular back hinge panel having opposed, parallel side edges and opposed, parallel end edges;

a pair of opposed, substantially rectangular display panels each having a first side edge hingedly connected to one of the side edges of said back hinge panel, and each further having a second side edge, and opposed, parallel end edges terminating in alignment with the end edges of said back hinge panel;

a pair of end hinge panels each including a first side edge and each having a second side edge, said end hinge panels each being hingedly connected along the second side edge thereof to an end edge of one of said display panels, with two of said end hinge panels being connected to the respective opposite end edges of each of said display panels, each of said end hinge panels having a width as measured normal to said second side edge which is substantially one-half the width of said back hinge panel;

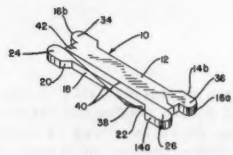
four flexible cover flaps each having an edge connected to the first side edge of one of the end hinge panels;

a pair of spaced locking panels hingedly connected to the second side edges of the two display panels, and dimensioned to overlap each other when the display panels are folded on said back hinge panel to positions ih which they extend parallel to each other, said locking panels each having a width as measured in a direction normal to the respective second side edge of the display panel to which each locking panel is connected which is substantially equal to the width of said back hinge panel;

a plurality of substantially parallel, spaced clip bars extending transversely across each of the display panels and spaced outwardly therefrom by a distance not more than one-half the width of said back hinge panel, and each having ends secured to one of the respective display panels on one side thereof; and

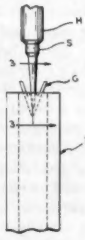
locking tabs carried on each of said flexible cover flaps for securing pairs of said flaps in overlapped relation to each other both at the time when said case is closed and with said display panels extending parallel to each other, and also at a time when said case is opened with said display panels in coplanar alignment and said flexible cover flaps folded back against the opposite side of said display panel from the side carrying said clip bars.

4,287,987
SUTURE HOLDER
Luther A. Hoffman, Sinking Spring, and Friedrich W. Schmidt, Ephrata, both of Pa., assignors to Sharpoint, Inc., Mohnton, Pa.
Filed Jul. 23, 1979, Ser. No. 59,677
Int. Cl.³ A61L *17/02*
U.S. Cl. 206—63.3 **5 Claims**



1. A suture packaging element comprising a body formed of a substantially planar, pierceable, nonsloughing material, the body having opposed side and end surfaces, a needle-receiving portion formed in a side surface of the body intermediate the opposed ends, the needle receiving portion comprising a recessed surface extending along a major portion of the side surface and a pair of opposed surfaces, one at each end of the recessed surface, extending outwardly from the recessed surface to the adjacent side surface of the body, thereby forming a pair of opposed enlargements, a second needle-receiving portion formed in the side opposite the first-mentioned needle-receiving portion and including a recessed surface extending along a major portion of said opposite side surface and a pair of opposed surfaces, one at each end of the recessed surface and extending outwardly from the recessed surface to the adjacent side surface of the body, thereby forming a second pair of enlargements, one at each end of the body.

4,287,988
SYRINGE SHEATH GUIDE
Richard F. House, St. Charles, Ill., assignor to Container Corporation of America, Chicago, Ill.
Filed Mar. 14, 1980, Ser. No. 130,573
Int. Cl.³ B65D *85/24*
U.S. Cl. 206—365 **2 Claims**



1. A one-piece molded plastic device for protecting and guiding the needle sheath portion of a hypodermic syringe into the cavity of a package, comprising:

(a) a pair of relatively thin, flat blades, joined at their forward edges and diverging rearwardly to form a wedge shaped structure;

(b) a hollow cylindrical sleeve formed integrally with the blades of said wedge shaped structure and extending rear-

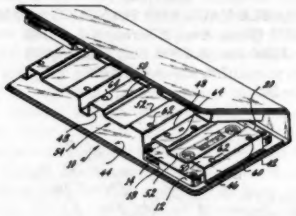
wardly therefrom for removably receiving a forward portion of a syringe sheath.

4,287,989

STORAGE CONTAINER FOR MAGNETIC TAPE CASSETTES

Edward B. Plummer, 29472 Thackery Dr., Laguna Niguel, Calif. 92677

Filed Dec. 14, 1979, Ser. No. 103,865
Int. Cl.³ B65D *85/67*
U.S. Cl. 206—387 **10 Claims**



1. A storage container for magnetic tape cassettes of the type having an enclosed case with essentially parallel top and bottom surfaces and two sets of essentially parallel side surfaces each set essentially mutually perpendicular to the other set, one of said side surfaces of one of said sets including an opening exposing the surface of the magnetic tape and two capstan locating holes passing through said cassette from said top surface to said bottom surface proximal to said side surface wherein said opening is located which comprises:

a support base;

at least one cassette holding sleeve fixedly mounted to said support base;

said cassette holding sleeve including two upstanding walls, each independently fixedly attached to said support base essentially perpendicular to said support base and spaced essentially parallel to one another at a distance slightly greater than the distance between the side surfaces of one of said sets of said side surfaces of said cassette, a top wall located with respect to said support base at a distance slightly greater than the thickness of said cassette between said top and said bottom surfaces of said cassette, said top wall attaching to each of said upstanding walls so together said support base, said upstanding walls, and said top wall form said holding sleeve, said holding sleeve capable of containing between said top wall and said support base at least that portion of said cassette which includes the capstan locating holes;

at least one protuberance means integrally formed with said top wall and projecting toward said support surface, said protuberance means positioned on said top wall to be located directly over one of said capstan locating holes when said cassette is located in said sleeve such that one of said sets of said side surfaces of said cassette are adjacent to said upstanding walls;

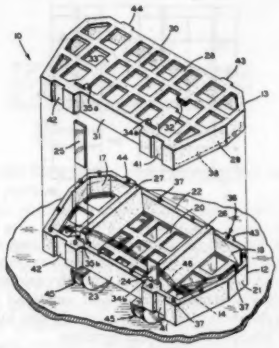
at least that portion of said top wall wherein said protuberance means are located capable of being distorted in a direction away from said support base when said cassette is inserted into said sleeve and then returning to its undistorted position when said cassette is positioned between said top wall and said support surface in a position wherein said protuberance means is aligned over one of said capstan locating holes to locate at least a portion of said protuberance means in one of said capstan locating holes.

4,287,990

GLASS SHEET SHIPPING PACKAGES

James F. Kuriek, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Jul. 30, 1979, Ser. No. 61,754
Int. Cl.³ B65D *85/48*
U.S. Cl. 206—448 **10 Claims**



1. In a composite shipping package of the type containing a stack of upstanding sheets of glass having curved end portions, wherein said sheets are supported on edge, the improvement comprising:

(a) an elongate, integrally formed, substantially rectangular male member, with spaced apart support members extending into and projecting from said male member for supporting said stack of glass sheets on edge, said male member being provided with a pair of spaced apart recesses for receiving the curved end portions of said stack of glass sheets and including a pair of side supporting members extending transversely thereacross and above the surfaces of the walls defining said recesses, said side supporting members bearing against one of the major surfaces of the stack of glass sheets;

(b) an elongate, integrally formed, substantially rectangular female closure member matching and interfitting with said male member and having a cavity for receiving said stack of glass sheets, said female closure member having apertures for receiving said support members projecting from said male member;

(c) means for securing said stack of glass sheets within said male and said female closure members; and

(d) further means surrounding said female closure member and said male member for securing them together.

4,287,991

MODULARIZED UNIT LOAD AND DISPOSABLE PALLET THEREFOR

Bernard P. Donnelly, 1306 Waukazoo Dr., Holland, Mich. 49423

Filed Apr. 2, 1979, Ser. No. 26,002
Int. Cl.³ B65D *19/00*
U.S. Cl. 206—597 **23 Claims**

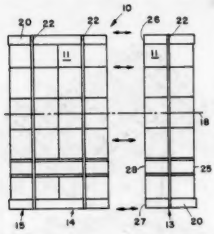
1. A modularized unit load of rectangular objects comprising:

a plurality of modules of said objects, each of said modules being capable of breaking away from the other modules, each of said breakaway modules comprising a parallel array of objects stacked in side-by-side relationship and approximately centered in a transversely extending plane, said breakaway modules being aligned in end-to-end relationship, each of said breakaway modules being approximately centered on a longitudinally extending axis;

a plurality of severable longitudinally extending braces for

interconnecting said modules and forming said unit load; and

a plurality of tension bands, at least one of said tension bands surrounding each of said parallel arrays of objects and said braces to secure each of said parallel arrays of objects in



modular form to facilitate handling of said objects contained therein, each of said breakaway modules being interconnected by said braces whereby said modules may be selectively removed from said unit load without destroying the structural integrity of said unit load by severing said braces between said modules.

4,287,992

RACK STRUCTURE

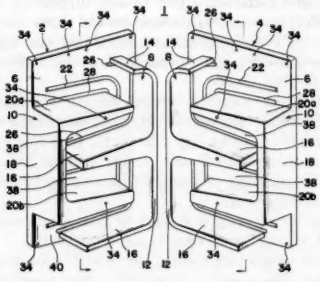
Kanji Takemori, Toyonaka, Japan, assignor to Shimoda Kogyo, Ltd., Osaka, Japan

Filed Feb. 21, 1979, Ser. No. 13,225

Claims priority, application Japan, Jul. 11, 1978, 53/84694; Aug. 23, 1978, 53/103174; Aug. 23, 1978, 53/116061[U]

Int. Cl.[3] A47F *1/00*

U.S. Cl. 211—49 D **9 Claims**



1. In a rack structure for a vending machine which comprises a pair of plastic rack halves each formed in a single unitary body, said rack halves when combined together in face-to-face relation having at least one serpentine passage defined therein, said serpentine passage having a first end, through which a plurality of articles are supplied successively into the serpentine passage, and a second end from which the articles in the serpentine passage can be removed one at a time from the rack structure, and means for connecting the rack halves together, said first end of the serpentine passage being positioned above said second end of the serpentine passage whereby the articles accomodated within the serpentine passage can move downwardly from said first end towards said second end successively by gravitational force each time the articles are removed from the rack structure from said second end one after another, at least one of the said rack halves comprising a substantially rectangular wall; at least two rows of ramp assemblies spaced apart from each other and cooperative with each other to define the serpentine passage; said ramp assemblies projecting from and in a direction substantially perpendicular to the substantially rectangular wall, and having ramp members alternately protruding into respective spaces each defined between the adjacent two of the ramp members of the other ramp assembly such that the passage assumes a serpentine shape when the rack halves are combined together, said substantially rectangular wall having a rib protruding outwards therefrom at a position intermediately between each one ramp member of said one ramp assembly and the next adjacent ramp member of said other ramp assembly and extending along the contour of the serpentine passage and grooves formed near the base portions of each of the ramp members along the contour of the serpentine passage.

4,287,993

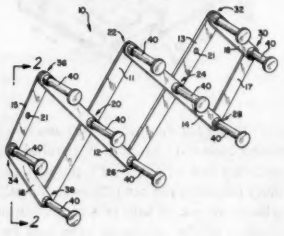
ADJUSTABLE RACK FOR HANGING ARTICLES

Vito Licari, 875 Ocean Ave., Elberon, N.J. 07740

Filed Jun. 6, 1980, Ser. No. 157,003

Int. Cl.[3] A47F *5/08*

U.S. Cl. 211—105 **10 Claims**



1. A rack for hanging articles comprising: at least a first pair of equally sized first and second members adjacent to one another, said second member having at least an aperture therethrough and said first member having a pin at one end integral with said first member, said pin being pivotably engaged within said aperture with the opposite end of said pin protruding through said aperture; and at least a hook member having a bore therein, said bore being sized to frictionally engage said opposite end of said pin in an interference fit and to thereby fasten said second member to said first member, said hook member, said pin and said aperture defining a pin joint to pivotably attach said first member to said second member.

4,287,994

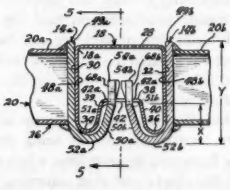
WEDGABLE STORAGE RACK

Herbert H. Klein, Arlington Heights, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Nov. 2, 1979, Ser. No. 90,536

Int. Cl.[3] A47F *5/00*

U.S. Cl. 211—191 **24 Claims**



1. A storage rack, comprising:

an upright post having a front face portion facing laterally outward away from the interior of the storage rack and an end face portion facing generally in a longitudinal direc-

tion, said front face portion defining at least one finger-receiving opening having an inclined side providing a wedging surface sloping generally downwardly and away from said end face portion, said wedging surface spaced longitudinally from said end face portion;

an elongated load-carrying beam extending generally horizontally in the longitudinal direction; and

wedging connector means secured to said load-carrying beam for interlocking engagement with said post to detachably connect and wedgingly secure said beam to said post, said wedging connector means having an elongated abutment plate positioned generally transverse to the longitudinal direction for abuttingly engaging and bearing against said end face portion and having an arm plate extending arcuately from said elongated abutment plate for positioning adjacent said post, said wedging connector means having at least one downwardly extending hook-shaped camming finger extending laterally inwardly from said arm plate generally toward the interior of said storage rack for engaging said finger-receiving opening to generally prevent substantial downward movement of said beam under load. said hood-shaped finger having a camming portion disposed substantially parallel to said wedging surface for cammingly engaging and interlockingly wedging against said wedging surface, said camming portion spaced longitudinally from said elongated abutment plate, the minimum longitudinal distance between said camming portion and said elongated abutment plate at any given location on said camming portion when said wedging connector means is detached from said post being normally less than the longitudinal distance between said wedging surface of said finger-receiving opening and said end face portion of said post at the location on said wedging surface corresponding to said given location on said camming portion, and said wedging connector means being expandable under the combined weight of said beam and its load to clampingly embrace and wedgingly engage said post.

4,287,995

CONTAINER SEALING MEMBER WITH OXYGEN ABSORBENT

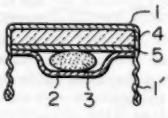
Takehiko Moriya, Tokyo, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 26, 1979, Ser. No. 97,425

Claims priority, application Japan, Nov. 30, 1978, 53-165451; Nov. 30, 1978, 53-165452; Dec. 4, 1978, 53-166842; Feb. 14, 1979, 54-17628; Mar. 6, 1979, 54-28218; Mar. 6, 1979, 54-28219; Mar. 6, 1979, 54-28220; Mar. 13, 1979, 54-32218

Int. Cl.³ B65D *85/72*

U.S. Cl. 215—228 **6 Claims**



1. A container sealing member for a container used for preserving an aqueous liquid or semi-liquid material, characterized in that the sealing member is provided with an oxygen absorbent and retainer means to hold said oxygen absorbent, and the absorbent is covered by a film which adheres to the sealing member so that when the sealing member is in use on a container the oxygen absorbent is prevented from contacting of the contents of the container, the film having a plurality of fine openings, and being gas-permeable, but water-impermeable at one atmospheric pressure and wherein the film has a plurality of fine openings in the range of from 0.01 to 45 microns.

4,287,996

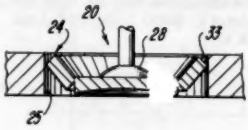
FLEXIBLE CLOSURES AND CLOSURE FOR BUNG OPENINGS

Herbert J. Wanderer, Wheatridge, Colo., assignor to Denver Plastics, Inc., Denver, Colo.

Filed Oct. 9, 1979, Ser. No. 83,110

Int. Cl.³ B65D *39/00*

U.S. Cl. 217—108 **19 Claims**



1. A closure for a surface defining an orifice comprising:

a central portion; and

an annulus portion arranged about said central portion connected at an inside edge by a hinge to said central portion, said annulus portion being pivoted about said hinge to move to an expanded position with a peripheral surface movable with said annulus portion in engagement with a surface defining an orifice and said annulus portion compressed between said central portion and said orifice surface, said annulus portion being disposed at an angle diverging back away from the top of said central portion at an angle to a radial line normal to the longitudinal axis of said central portion and pivoting toward said radial line to said expanded position.

4,287,997

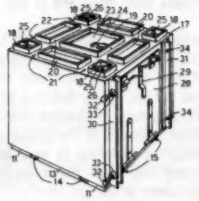
CONTAINER FOR TRANSPORTED GOODS

Keith O. Rolfe, Netley, Goovigen, Queensland, Australia 4702, and Clifford E. Smith, "Karawatha", Thangool, Queensland, Australia 4716

Filed Jan. 29, 1980, Ser. No. 116,546

Int. Cl.³ B65D *21/02, 88/12*

U.S. Cl. 220—1.5 **2 Claims**



1. A container for transported goods of substantially rectangular form, having sides, ends, top and bottom, wherein:

the length of the container is substantially equal to its width,

connector means are provided at one end of the container for releasably connecting the container, end to end, to the corresponding end of another similar container,

a doorway and closure for said container in said one end thereof,

supporting members of open-bottom box-like form secured below the container bottom for supporting it above ground level,

passages between said supporting members capable of receiving, from both sides and both ends of the container, the tines of a fork-lift vehicle, and

container locating members secured on the top of the container and arranged to interfit, without obstructing said passages, with said supporting members of a similar container superimposed thereon and in vertical alignment therewith,

said locating members also being of open-top box-like form, with one of said locating members being a coaming for a

hatch leading into the container, and a closure for said coaming.

4,287,998

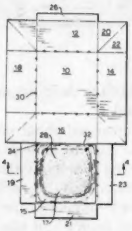
DEW WORM CARTON

John Zimmermann, Scarborough, Canada, assignor to Somerville Belkin Industries Limited, London, Canada

Continuation-in-part of Ser. No. 17,252, Mar. 5, 1979, abandoned. This application May 13, 1980, Ser. No. 149,469

Int. Cl.³ B65D *5/42, 5/24, 5/66*

U.S. Cl. 229—16 R **3 Claims**



1. A paperboard container blank having, an inside face and an outside face adjacent wall panels defined by fold lines that are die formed depressions in said inside face of the container blank;

U-shaped cuts in the blank each having two arms and a base, each arm having a free end and an end joining the base, said U-shaped cuts interrupting the fold lines to form U-shaped tabs, the direction of the arms of the U-shaped cuts being transverse of the direction of the fold lines, the tops of the arms of the U-shaped cuts being on a first one of two adjacent panels adjacent a fold line, and the base of the U-shaped cuts being in the second one of two adjacent panels;

said U-shaped cuts in said blank being wider at the inside face of the blank than they are at the outside face of the blank;

the distance between the arms of said U-shaped cut being less than 3/32 of an inch and the length of the arms being greater than the distance between them, the container being adapted for set up by folding said blank about said fold line whereby said U-shaped tabs separate from said second panel and remain in the plane of said first panel to leave a ventilating opening in said second panel at the corner between said first panel and said second panel when the container is set up.

4,287,999

SECONDARY SEAL FOR FLOATING ROOF STORAGE TANK

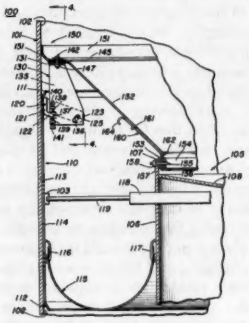
Milton W. Heisterberg, Flossmoor, Ill., assignor to GATX Tank Erection Corporation, Chicago, Ill.

Filed May 21, 1980, Ser. No. 151,786

Int. Cl.³ B65D *88/42*

U.S. Cl. 220—222 **15 Claims**

1. A floating roof storage tank comprising an upstanding cylindrical tank shell for containing a quantity of liquid to be stored, a floating roof within said tank shell and adapted to float on the surface of the liquid within said tank shell, a circular metal shoe encircling said floating roof and slidably engaging the inner surface of said tank shell, pusher structure mounting said metal shoe upon said floating roof and urging said metal shoe into sealing contact with the inner surface of said tank shell, a sealing member extending between said floating roof and said metal shoe and closing the space therebetween to provide a primary seal therebetween, a plurality of seal support members shiftably mounted upon said metal shoe adjacent to the upper end thereof and shiftable toward and away from the associated tank shell, and flexible means extending between said floating roof and said seal support members and secured thereto and extending beyond said seal support members and lying in sealing engagement with the inner surface of said tank shell to form a secondary seal between said floating roof and



said tank shell, said seal support members being shiftable toward and away from said tank shell to accommodate variations in position of said floating roof with respect to said tank shell and being shiftable away from said tank shell to move said flexible means out of contact with said tank shell a distance to permit inspection of the primary seal.

4,288,000

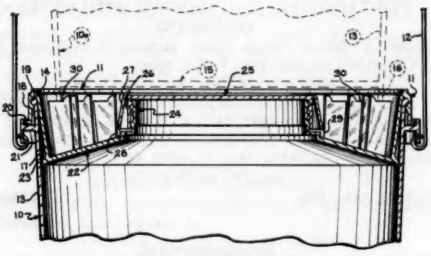
CHILD-RESISTANT LID FOR A PAIL

Charles E. Luker, and Peter P. Gach, both of Evansville, Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Aug. 4, 1980, Ser. No. 174,736

Int. Cl.³ B65D *43/04*

U.S. Cl. 220—281 **10 Claims**



1. A lid for a pail or bucket, said lid and the rim of said pail having co-operating snap-over means for retaining said lid on said pail, said lid having

(a) a short, centrally located neck,

(b) an annular body, integral with and surrounding said neck,

(c) an inner annular skirt at the periphery of said body and extending upwardly therefrom to a level above the top of said neck,

(d) a rim at the junction on said body and said inner skirt that is adapted to tightly fit the inner surface of the pail,

(e) an outer annular skirt depending from the upper end of said inner skirt which is adapted to fit circumjacently to the outer side of the pail,

(f) a removable closure for said neck, and

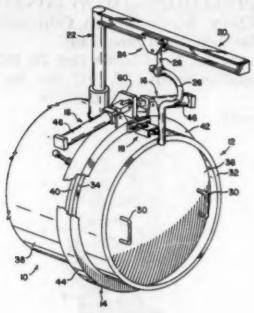
(g) co-operating, disengageable child-resistant means on said body near said neck and on said closure.

4,288,001

CLOSURE ARRANGEMENT FOR PRESSURE DEVICE

Robert J. Lankston, Shawnee, Kans., assignor to Gulf & Western Manufacturing Company, New York, N.Y.

Filed Jul. 15, 1980, Ser. No. 169,036
Int. Cl.³ B65D *45/00*
U.S. Cl. 220—316 **31 Claims**



1. A closure for a pressure device having an opening bounded by a radially projecting circumferential flange comprising, a cover member having a radially projecting circumferential flange axially engaging said flange on said pressure device, clamping ring means releaseably interengaging said flanges on said pressure device and said cover member, said clamping ring means extending circumferentially about said flanges and having circumferentially adjacent end means, said ring means being displaceable laterally relative to said flanges between first and second positions in which said ring means respectively interengage said cover member and said pressure device and release said cover member for removal from said pressure device, means for displacing said clamping ring means between said first and second positions, releaseable latching means interengaging said end means of said ring means in said first position against displacement toward said second position, and means including bleed valve means on one of said cover member and pressure device preventing release of said latch means until the interior of said pressure device is vented to atmosphere.

4,288,002

THERMALLY INSULATED VESSEL, ESPECIALLY FOR LIQUEFIED GASES

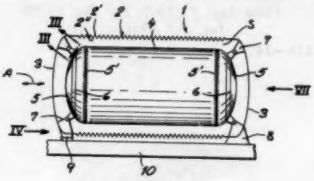
Horst Göbl, Garching, Fed. Rep. of Germany, assignor to Linde AG, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 636,964, Dec. 2, 1975, Pat. No. 4,176,761. This application Sep. 12, 1979, Ser. No. 74,777
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1974, 2457264
The portion of the term of this patent subsequent to Dec. 4, 1996, has been disclaimed.
Int. Cl.³ F17C *3/08*; B65D *81/18, 88/06*
U.S. Cl. 220—438 **6 Claims**

1. An insulated vessel for the storage or transport of liquefied gas comprising:

an inner axially elongated generally cylindrical receptacle receiving said liquefied gas;

an outer axially elongated generally cylindrical receptacle spacedly surrounding said inner receptacle and substantially coaxial therewith, said receptacles defining between them an empty evacuatable space, said outer receptacle comprising at its ends a pair of opposing shell members, said outer receptacle having an intermediate tubular member sealingly connected to said shell members and disposed between the shell members, said intermediate member being corrugated over its length with the corrugations formed by annular alternating troughs and crests, said troughs and crests each lying in a respective plane perpendicular to the longitudinal axis of said receptacles, said corrugations forming unitary stiffening formations of said intermediate member preventing radial expansion and



contraction thereof but permitting elastic axial expansion and contraction of said intermediate member; and

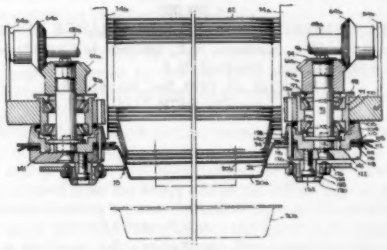
support elements rigidly connected to said inner receptacle engaging said shell members and supporting said outer receptacle on said inner receptacle.

4,288,003

APPARATUS FOR AUTOMATICALLY DISPENSING NON-ROUND FLEXIBLE CONTAINERS

Carl Fries, Jr., Holland, Pa., assignor to International Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 869,505, Jan. 16, 1978, Pat. No. 4,180,180. This application Dec. 13, 1979, Ser. No. 103,043
Int. Cl.³ B65G *59/10*
U.S. Cl. 221—1 **10 Claims**



1. An apparatus for dispensing non-round, flexible, elastic, flanged containers having corners and non-vertical sides, from the bottom of a nested stack of the containers, said apparatus comprising:

(a) a base; and

(b) a plurality of rotor assemblies to operate on the stack, each rotor assembly being rotatably mounted on the base for synchronized movement with respect to the one or more other assemblies and comprising:

(i) support means;

(ii) separating means;

(iii) release means, and

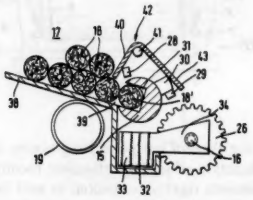
(iv) compressive means;

wherein the support means, separating means, and release means are rotatably fixed with respect to each other and the compressive means is rotatably and eccentrically mounted with respect to the support means, separating means, and release means.

4,288,004
CIGARETTE DISPENSER WITH A LIGHTING ARRANGEMENT

Willi Göhringer, Glagenbergstr. 56; Friedrich Hachtel, Ziegelstr. 132, both of 7080 Aalen, and Wolf E. Müller, Balsewitzer Ring 4, 1 Berlin 20, all of Fed. Rep. of Germany

Filed Aug. 27, 1979, Ser. No. 69,994
Int. Cl.³ A24F *15/10*
U.S. Cl. 221—147 **10 Claims**

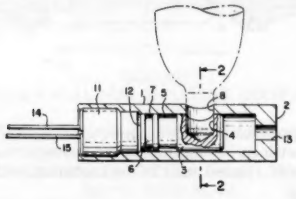


1. In a cigarette dispenser with an ignition arrangement, the dispenser having a housing with a storage chamber for the cigarettes, an ignition head mounted in the interior of the housing, and an arrangement for expelling a lighted cigarette through a housing opening, the improvement wherein the floor of the storage chamber is in the form of a funnel and ends in a discharge slot, and comprising a rotatable drum having a cigarette-receiving recess therein disposed downstream of the discharge slot, a reversible electric motor adapted selectively to rotate the drum in opposite directions, a drive train between the motor and the drum, said drive train having a disconnectable coupling interposed in the drive train, an outlet channel disposed beneath the drum, an ignition head in the channel, and means driven by the motor for driving the ignition head in reverse directions, in its forward travel toward the housing opening the ignition head thrusting a cigarette in the discharge channel toward the opening and lighting it.

4,288,005
PRESSURIZED GAS BOTTLE DISCHARGE DEVICE

Edward Soo-Hoo, Stanhope, N.J., assignor to Cartridge Actuated Devices, Inc., Fairfield, N.J.

Filed Jul. 27, 1979, Ser. No. 61,535
Int. Cl.³ B67B *7/24*
U.S. Cl. 222—5 **5 Claims**

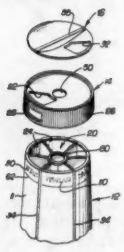


2. Apparatus for discharging a gas bottle, comprising:
(a) a body provided with a longitudinal bore and a transversely facing orifice into said bore adapted to receive the neck of a gas bottle, and
(b) a ram member slidably disposed in said longitudinal bore and provided with a transverse bore adapted to receive the end of the neck of the gas bottle, said ram member being initially positioned with said transverse bore aligned with said orifice,
(c) one end of said longitudinal bore being adapted to receive a pyrotechnic device for driving, when fired, said ram to a second position, shearing off the neck of the bottle and carrying the end thereof in said transverse bore,
(d) said ram member being provided with a peripheral groove which, when said ram is in said second position, lies under said transversely facing orifice in said body,
(e) said body being provided with at least one further orifice that opens into said groove when said ram is in said second position.

4,288,006
MULTI-COMPARTMENT CONTAINER

William M. Clover, Jr., Costa Mesa, Calif., assignor to Dale J. Kirstine, San Juan Capistrano, Calif.

Continuation of Ser. No. 623,860, Oct. 20, 1975, abandoned.
This application May 18, 1977, Ser. No. 798,047
Int. Cl.³ B65D *83/04*
U.S. Cl. 222—42 **8 Claims**



1. A dispenser comprising:
a container body;
means defining a series of juxtaposed compartments in said container body each having an upper opening;
a selector cap rotatably mounted on said container body covering said upper openings and having a selector aperture, said selector cap having first means adapted to be gripped to manually rotate said selector cap;
a cover plate with an access aperture movably mounted on said selector cap for rotation together with and relative to said cap and having second means adapted to be gripped to manually rotate said cover plate;
third means proximate the axis of rotation of said cover plate for (a) providing a pivot axis for said cover plate relative to said selector cap, (b) maintaining said cover plate in tight relation with said selector cap and resisting relative rotation therebetween and (c) causing said cover plate to rotate with said selector cap when only said first means is gripped and manually rotates; and
fourth means on said selected cap and said container body and located proximate the periphery of said selector cap for both (a) releasably maintaining said selector cap over one of said plurality of compartments and (b) requiring an unlocking force greater than the resisting force of said third means for preventing said selector cap from rotating with said cover plate when only said second means is gripped and manually rotated.

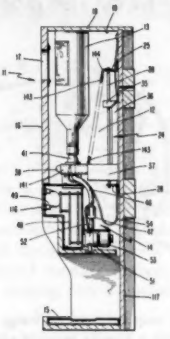
4,288,007
STRUCTURE FOR HOLDING A RESERVOIR IN AN INVERTED POSITION FOR GRAVITY DISPENSING OF A LIQUID

Dan C. Rogers, and Joseph A. Maggio, both of Miami, Fla., assignors to M.R.E. Enterprises, Inc., Miami Lakes, Fla.

Filed Jun. 2, 1978, Ser. No. 911,897
Int. Cl.³ B67D *5/60*
U.S. Cl. 222—66 **28 Claims**

1. A structure for enabling liquid to be dispensed by gravity from orifices at the tops of a plurality of bottles adapted to be inserted simultaneously in situ into the structure, differing simultaneously inserted bottles being susceptible of having differing heights along longitudinal axes thereof between a bottom surface thereof and the top, comprising means for

simultaneously holding the plurality of bottles in an inverted position so that the orifices of the bottles are below the bottom surfaces thereof and the longitudinal axes of the bottles are substantially vertical, said holding means including a stationary, horizontally extending first surface against which the bottom surfaces of all the bottles simultaneously bear, a separate horizontally extending second surface for each bottle, each second surface being arranged so a portion of the bottle removed from the bottom surface of the bottle bears against it, each of said second surfaces being vertically translatable relative to the first surface to accomodate bottles of differing



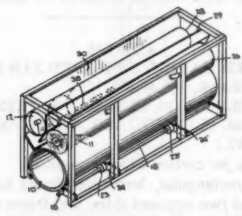
heights, spring means for separately controlling the vertical position of each of the second surfaces and for maintaining the bottom surface and the removed bottle portion of each of the bottles in a bearing relation against the first surface and the separate second surfaces, valve means in fluid flow relationship with liquid at the orifice of each bottle for selectively enabling liquid to be dispensed by gravity from each of the bottles, and vent means for each of the bottles extending through the orifice of each of the bottles for applying sufficient pressure to an air-liquid interface in each bottle to cause the liquid in each bottle to flow by gravity to the valve means of each bottle.

4,288,008

AGRICULTURAL SPREADER DEVICE OF MODULAR DESIGN FOR PULVERULENT MATERIAL

Jean-Louis Amblard, Bédillous Rte. de l'Aérodrome, 33250-Cissac (Gironde), and Pierre M. Saintemarie, 33112-Saint Laurent du Médoc (Gironde), both of France

Filed Nov. 19, 1979, Ser. No. 95,432
Claims priority, application France, Nov. 24, 1978, 78 33645
Int. Cl.[3] G01F *13/00*
U.S. Cl. 222—281 **14 Claims**



1. An agricultural device adapted to spread pulverulent or granular material such as seed or fertilizer, said device having at least one operating assembly comprising:

(A) a plurality of rollers supported on a frame, at least one roller being a drive roller;

(B) a cylinder disposed within said frame and resting on said rollers, said cylinder being caused by the drive roller to rotate;

(C) a distribution hopper for distributing material fed thereto across the top surface of the rotating cylinder; and

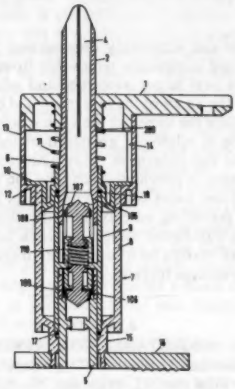
(D) a rotary brush adjacent said hopper on the discharge side of the cylinder and engaging said cylinder to discharge the material from the surface thereof.

4,288,009

LIQUID MEASURING DEVICE

Graham M. A. Simmons, 22, Chalfont Rd., Seer Green, Buckinghamshire, England

Filed Mar. 18, 1980, Ser. No. 131,401
Int. Cl.[3] G01F *11/16*
U.S. Cl. 222—442 **4 Claims**



1. A liquid measuring and dispensing device comprising: a flow tube providing an inflow duct and an outflow duct; an upper valve seat provided at the lower end of the inflow duct; a lower valve seat provided at the upper end of the outflow duct; a measuring chamber axially slidable relative to the flow tube; and a valve carrier connected to the measuring chamber for movement therewith; an upper valve member and a lower valve member carried by the valve carrier; the measuring chamber being movable between an upper and a lower position through an intermediate position; in the lower position of the chamber, the lower valve member seating on the lower valve seat to close communication between the chamber and the upper end of the outflow duct but the upper valve member being unseated from the lower end of the inflow duct to provide communication between the inflow duct and the chamber; in the upper position of the chamber the upper valve member seats on the upper valve seat closing communication between the inflow duct and the chamber but the lower valve member is unseated from the lower valve seat to provide communication between the chamber and the outflow duct; in the intermediate position of the chamber, both valve members seat on the respective valve seats to close communication between the chamber and both the inflow and outflow ducts; and throughout movement of the chamber between its upper and lower positions, the chamber remains in communication with the portion of the flow tube between the valve seats.

4,288,010

EMBROIDERY THREAD ORGANIZER

Joseph W. Holladay, Eatontown, N.J., assignor to Jo-Pat, Incorporated, Nashville, Tenn.

Filed Sep. 21, 1979, Ser. No. 77,631
Int. Cl.[3] A41H *31/00*
U.S. Cl. 223—106 **6 Claims**

1. Apparatus for storing and dispensing plural lengths or

windings of threads and yarns and the like previously transferred thereto, for example, from respective skeins while preventing entanglement, comprising the combination of:

at least three nestable cylindrical tubes of substantially equal length and varying sizes, each tube being relatively elongated and unitary and having a pair of end members and a plurality of relatively flat faced vanes acting as dividers spaced intermediate said end members, said end members and said vanes being integral with a respective tube to define plural retention regions on each tube for individual winding of said threads and yarns transferred thereto, said end members and said vanes having a generally circular

perimeter and selectively dimensioned to slide freely in and out and completely removable from the inner diameter of the next larger sized tube and wherein the spacing between the vanes of the innermost and outermost tubes is substantially the same but the vane spacing of the intermediate tube is relatively greater than the spacing of said innermost and outermost tubes whereby increased structural rigidity is provided, each tube and its respective end members and vanes being comprised of transparent material for providing ease of identification of the various windings transferred thereto and each tube further having a frictional surface on its outer wall to prevent the slipping of said windings thereon.

4,288,011

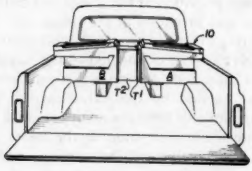
ADJUSTABLE CONTAINER

Robert D. Grossman, 22 Rivo Alto Dr., Miami Beach, Fla. 33139

Filed Jan. 22, 1979, Ser. No. 5,742

Int. Cl.[3] B65D *43/16*

U.S. Cl. 224—42.42 **16 Claims**



1. An adjustable container adapted to fit between the side panels of pickup trucks, said container comprising first and second sections, said first section having a bottom wall, an open top wall, a closed end wall, an open end wall, first and second longitudinal side walls, a bottom support means connected to said bottom wall and adapted to rest upon the pickup truck bed, an upper support means formed by said side walls and said closed end wall and adapted to rest upon one of said side panels, and a first telescoping means connected to said open end wall, said second section having a bottom wall, an open top wall, a closed end wall, an open end wall, first and second longitudinal side walls, a bottom support means connected to said bottom wall and adapted to rest upon the pickup truck bed, an upper support means formed by said side walls and said closed end wall and adapted to rest upon the other one of said side panels, and a second telescoping means connected to said open end wall, said first telescoping means adapted to be slidable within said second telescoping means whereby said longitudinal dimension of said container is adjustable by the relative movement of said first and second telescoping means, each of said sections including a closure means to cover said open top wall, each closure means on each section being operable from a closed to an open position regardless of the relative positions of said first and second telescoping means wherein said bottom support means is adapted to space said bottom walls from said pickup truck bed and to slide upon said bed as said container is adjusted whereby bottom support is provided for said container regardless of the relative positions of said first and second telescoping means.

4,288,012

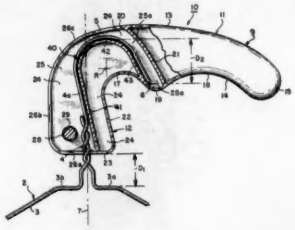
COATHANGER SUSPENDER

Roni K. Doak, 15021 Kimberley La., Houston, Tex. 77079

Filed Sep. 6, 1979, Ser. No. 72,947

Int. Cl.[3] A45C *13/26*

U.S. Cl. 294—143 **3 Claims**



1. A coathanger suspender comprising:

a housing defining a handle portion shaped to be comfortably carried by hand, and a magazine portion adapted for suspending one or more coathangers and, in use, extending forwardly and downwardly of said handle portion in a vertical plane;

said handle having a curved top wall, an outer wall, side walls, a bottom wall, and a first transverse wall extending between said side walls and being spaced from said outer wall; and

said magazine portion having a pair of opposed front and back side walls and a transverse, generally U-shaped hook wall spaced inwardly from the edges of said front and back side walls to form therebetween a magazine chamber having a slot, the outermost end of said hook wall forming with said first transverse wall an inner channel which is in communication through said slot with said magazine chamber whereby, in use, the outer end of the hook of a coathanger is captured through said slot within said inner channel, the curved portion of said hook rests on the curved portion of said hook wall, and the innermost end of said hook of said coathanger resting on the innermost end of said hook wall, so that said handle portion allows the hand of the user to comfortably carry the magazine portion, with the coathanger resting outside of and being easily removable from or mounted on said hook wall.

4,288,013

JAR CARRIER HAVING U-SHAPED JAR RETAINERS

David Napier, Roark, Ky. 40979

Filed Sep. 19, 1979, Ser. No. 77,106

Int. Cl.[3] B65D *71/00*; A47B *73/00*

U.S. Cl. 294—87.2 **4 Claims**

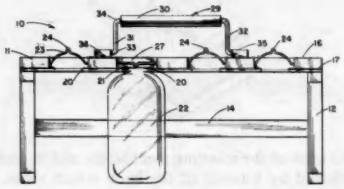
1. A portable jar carrier which comprises:

a generally rectangular, horizontal frame having a top, a bottom and two opposed sides, said frame defining a first plurality of generally U-shaped openings along each of the opposed sides, said frame further defining a second plurality of generally U-shaped openings along each of the opposed sides, each of said second plurality of openings being smaller and aligned with one of the first plurality of openings, the first and second plurality of openings thereby defining a plurality of lipped openings for reception and support of jars therein;

legs mounted to said frame and extending downwardly therefrom;

handle means secured to said frame; and

retaining means mounted to said frame for retaining a jar within each of the plurality of U-shaped openings, said retaining means including each of the openings having a separate, generally U-shaped member pivotally mounted



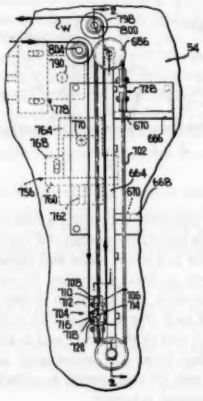
to said frame, each of the U-shaped members having end portions received in apertures in said frame located on opposite sides of the respective U-shaped opening, each of the retaining members being pivotable about the end portions from an open position to a closed position in which the U-shaped member engages the jar, whereby each U-shaped opening may be individually opened or closed.

4,288,014

DANCER ROLL ASSEMBLY

Jack R. Evers, Torrance, Calif., assignor to Developak Corporation, Redondo Beach, Calif.

Filed Sep. 17, 1979, Ser. No. 76,446
Int. Cl.³ B65H *25/04*
U.S. Cl. 226—44 **9 Claims**



1. A dancer roll arrangement for use with a web feeding device, said arrangement comprising upper and lower shafts, axially spaced sprockets on said shafts in vertically aligned relation, endless belts entrained over said aligned sprockets, a dancer roll shaft extending between and secured to said belts in supported relation parallel to said upper and lower shaft, a dancer roll carried by said dancer roll shaft for controlled vertical movement and control means coupled to one of said upper and lower shafts for controlling the rotation thereof.

4,288,015

CONTACTLESS WEB TURNING GUIDE

Larry E. Curtin, Rockford, Ill., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,707
Int. Cl.³ B65H *23/24, 23/32, 17/32*
U.S. Cl. 226—97 **3 Claims**

1. A web turning guide whereby a web that runs lengthwise along a defined path is contactlessly supported and guided through an arcuate turn in a portion of said path, said guide having a surface which is convexly curved in the direction that the web runs, and having means for maintaining a film of pressure air between said surface and a web, there being an area of said surface which is normally overlain by a web and which has parallel boundaries that extend in said direction and are spaced apart by a distance equal to the width of the web, said web turning guide being characterized by:

a pair of elongated pressure air edge-jet outlets adjacent to each of said boundaries, each of said edge-jet outlets extending substantially parallel to said boundaries and substantially entirely along said area in the direction that the web runs, each pair of edge-jet outlets comprising

(1) an outer edge-jet outlet spaced a small distance outwardly of its adjacent one of said boundaries, to be outside said area, and

(2) an inner edge-jet outlet within said area and spaced a small distance from its adjacent one of said boundaries to be overlain by a marginal portion of a web,

means positioning both edge-jet outlets of each pair to direct pressure air along said surface in the direction towards the other pair of edge-jet outlets; and

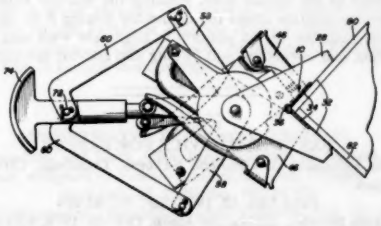
means for directing pressurized air to each of said edge just outlets.

4,288,016

CORNER BEAD AND INSTALLATION TOOL

Stephen J. Failla, Chester, N.J., and Raymond S. Perry, Miami, Fla., assignors to Plastic Components, Inc., Miami, Fla.

Filed Nov. 21, 1979, Ser. No. 96,307
Int. Cl.³ B25C *1/02*
U.S. Cl. 227—30 **11 Claims**



1. A corner bead installation tool including an elongated support having longitudinally spaced abutment structures defining registered generally V-shaped notches opening outwardly alongside of said support and adapted to abut the outer surfaces of the flanges of a corner bead extending along said support and having its apex portion seated in said notches, a pair of fastener guns mounted on said support and including abutment surfaces thereof from which fastener may be ejected, said abutment surfaces being disposed, generally, in planes lying along and extending between corresponding sides of said

notches, said fastener guns each including an actuator shiftable between active and inactive positions and means operative in response to shifting of said actuators to said active positions to eject fasteners from said abutment surfaces in directions generally normal thereto, operator means shiftably supported from said support and operative to substantially simultaneously shift said actuators toward said active positions in reponse to shifting to the operator means.

4,288,017

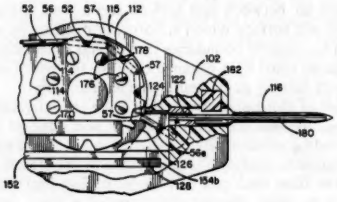
METHOD AND APPARATUS FOR DISPENSING FASTENERS

David B. Russell, Southborough, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Division of Ser. No. 827,276, Aug. 24, 1977, abandoned. This application Aug. 31, 1979, Ser. No. 71,458

Int. Cl.³ A41H *37/00*

U.S. Cl. 227—67 **22 Claims**



1. Apparatus for advancing connected fasteners which are each formed by a flexible filament angularly connected to an end bar, comprising

a housing,

means for mounting a slotted hollow needle on said housing,

means associated with said housing for advancing each fastener to a position for being dispensed including means for aligning the end-bar of each fastener with the bore of said hollow needle by a cam that is movable back and forth within said housing to rotate said end-bar about a connector joining it to the end-bar of the next fastener that is being advanced.

2. The method of dispensing a fastener through a hollow slotted needle from fastener stock comprising a plurality of fasteners each of which has a filament with a transversely disposed end-bar at one end, end-bars of adjacent fasteners being joined end-to-end by severable connectors, said method comprising advancing said fastener to a position adjacent the rear portion of the needle bore with the end-bar transversely disposed to the needle bore, rotating the end-bar from said transverse position about the connector joining it to the next adjacent end-bar into a position in alignment with said bore, severing said connector, and forcing said end-bar through said bore.

4,288,018

FASTENING DEVICE FOR PAPERS

Fumio Taniguchi, 5, Ueno-cho 5-chome, Tajimi-shi, Gifu-ken, Japan

Filed Oct. 10, 1979, Ser. No. 83,954

Claims priority, application Japan, Oct. 30, 1978, 53-133587

Int. Cl.³ B25C *1/02*

U.S. Cl. 227—76 **5 Claims**

1. A fastening device for papers, comprising:

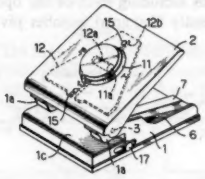
a punching mechanism with punching depression drivers which move upwards and downwards;

a stapling mechanism with depression drivers for pushing out contained staples and fastening papers together;

a depression mechanism with pressing parts for depressing the depression drivers in said punching and stapling mechanisms;

a selecting mechanism knob for selecting the interlocking of the pressing parts with said depression drivers by sliding a moving plate comprising said pressing parts; and

a selection indicator in association with said selecting mechanism, wherein the selection indicator is installed around



the knob of the selecting mechanism, and the indication is effected by rotation of the knob which slides the plate comprising said pressing parts in three steps corresponding to the selection of punching or stapling or both thereof.

4,288,019

PIVOTED STAPLER ASSEMBLIES

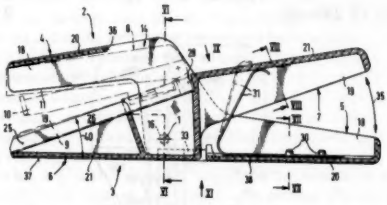
Gerald Dahle, Coburg, Fed. Rep. of Germany, assignor to Wilhelm Dahle Buro- und Zeichengerätefabrik, Coburg, Fed. Rep. of Germany

Continuation of Ser. No. 969,308, Dec. 13, 1978, abandoned. This application Mar. 7, 1980, Ser. No. 128,114

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1978, 2800042

Int. Cl.³ B25C *5/02*

U.S. Cl. 227—144 **31 Claims**



1. In a stapler assembly including a frame composed of first and second levers pivotably connected together to pivot relative to one another in a pivot plane and about an axis of pivotal pivotal movement, at least a portion of each lever having a U-shaped cross section, and an office stapler which is operable independently of said frame and which is releasably fastened to, and carried by, one of the levers and is arranged to be acted upon by the other lever for movement with respect to an associated pivot axis of said stapler to effect a stapling operation, the improvement wherein:

each of said levers is a two-armed lever the arms of which are disposed to respectively opposite sides of the axis of pivotal movement and said levers cross each other in the form of scissors;

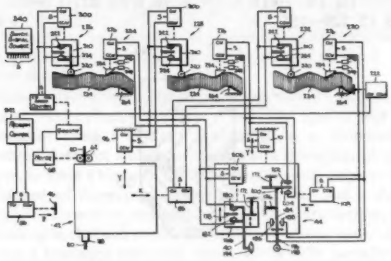
said first lever is provided, in the region of said axis of pivotal movement, with a passage opening and includes a pair of lateral jaws coplanar with the sides of said U-shaped portion of said first lever and laterally delimiting said passage opening; and

a portion of said stapler extends into said passage opening.

4,288,020
TRACKING TYPE WELDING APPARATUS

William K. Searles; Richard J. Searles, both of Katonah, and Kenneth R. Searles, Bedford Village, all of N.Y., assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Jul. 2, 1979, Ser. No. 54,264
Int. Cl.[3] B23K *37/02*; B23Q *15/013*
U.S. Cl. 228—7 29 Claims



1. A welding apparatus comprising:

workpiece mounting means for mounting a workpiece to be welded,

a probe and torch assembly including a probe and a welding torch positioned a fixed distance from each other in a given direction and each being separately movable transversely of said given direction,

main drive means for producing relative movement between said workpiece mounting means and said probe and torch assembly in said given direction,

said probe being constructed to follow transverse deviations of a seam to be welded during said relative movement, said probe being provided with a probe motor to drive the probe to follow said transverse deviations, said probe further being provided with a probe sensor to sense said deviations and a probe switch actuable by said probe sensor,

said torch being provided with a torch drive motor arranged to drive said torch to undergo transverse deviations,

an adjustable contour cam positioned remotely from said probe and torch assembly, said cam comprising a pin mounting means and a plurality of pins positioned side by side and forming a line on said mounting means,

a pin setter and reader assembly including a pin setter and a pin reader mounted at a predetermined distance from each other along said line and each being separately movable in the longitudinal direction of the pins in contact with said pins,

cam drive means for producing relative movement between said pin mounting means and said pin setter and reader assembly along said line, so that said setter and reader successively contact different ones of said pins during said relative movement,

said pin reader being constructed to follow the longitudinal positions of the pins it contacts during said relative movements, said pin reader being constructed and arranged to follow said longitudinal positions of the pins, said pin reader further being provided with a reader sensor to sense changes in said longitudinal positions from one pin to the next,

said pin setter including a pin setter drive motor arranged to adjust the longitudinal position of the pins it contacts during said relative movement,

first synchronizing means connected between said main drive means and said cam drive means to synchronize their operation,

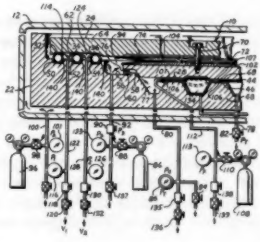
second synchronizing means comprising a circuit including said probe switch, said probe motor and said pin setter drive motor connected such that actuation of said switch operates said probe motor and said pin setter drive motor together to synchronize the movements of said pin setter with those of said probe, and

third synchronizing means comprising a circuit including said reader sensor and said torch drive motor connected such that actuation of said probe switch programs said pin setter and said pins to subsequently operate said reader sensor and said torch drive motor together to synchronize the movements of said torch drive with those of said pin reader.

4,288,021
TOOLING FOR SUPERPLASTIC FORMING DIFFUSION BONDING PROCESSES

Walter Leodolter, Rancho Palos Verdes, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 3, 1979, Ser. No. 81,483
Int. Cl.[3] B23K *20/14*
U.S. Cl. 228—15.1 12 Claims



1. Tooling for use in superplastic forming diffusion bonding processes which includes:

a first member having a first die surface thereon and a first seal engaging surface about said first die surface;

a second member having a second die surface thereon and a second seal engaging surface about said second die surface, said first and second die surfaces facing each other and said first and second seal engaging surfaces facing each other;

a plurality of tubular sealing rings spaced from each other and positioned in contact with said first and second seal engaging surfaces, said first and second seal engaging surfaces and said plurality of sealing rings defining a plurality of cavities; and

a plurality of conduits extending to the defined cavities for introducing and removing gas therefrom, said plurality of tubular sealing rings having a higher pressure side portion and a lower pressure side portion, said higher pressure side portion having at least one opening therethrough so that pressure can be introduced within said tubular sealing rings to expand them in response thereto.

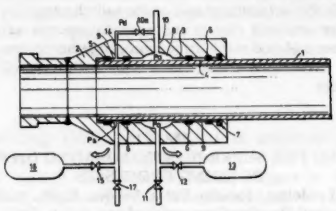
4,288,022
UNDERWATER EXPLOSIVE WELDING

Terence Sim, and Keith Allen, both of Barrow-in-Furness, England, assignors to Vickers Limited, London, England

Filed Oct. 10, 1979, Ser. No. 83,274
Claims priority, application United Kingdom, Oct. 10, 1978, 39943/78
Int. Cl.[3] B23K *28/00*
U.S. Cl. 228—107 3 Claims

1. A method of explosively welding together an inner first tubular member and an outer second tubular member underwater which comprises inserting the first tubular member into the second tubular member so that the outer surface of the first tubular member and the inner surface of the second tubular member are spaced apart to form an annular cavity, sealing the cavity to prevent ingress of water, cleaning and drying the cavity, introducing gas into the cavity at a pressure greater

than the surrounding water pressure, and reducing the pressure in the cavity prior to detonating an explosive charge within the first tubular member to cause the outer surface of the first



member to be urged across the cavity and into collision with the inner surface of the second member and become welded thereto.

4,288,023

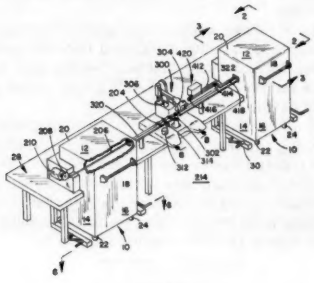
PARTS STORAGE AND HANDLING SYSTEM

John E. Larrison, Costa Mesa, Calif., assignor to Orthodyne Electronics, Costa Mesa, Calif.

Filed Jul. 12, 1979, Ser. No. 56,803

Int. Cl.³ B65G *1/06*

U.S. Cl. 228—110 **14 Claims**



13. A process for moving and storing electronic parts comprising:

providing a plurality of tubular elongated conduits having openings passing therethrough which are in side by side hinged relationship;

providing support means upon which said tubular elongated conduits are supported;

indexing said tubular elongated conduits with respect to a delivery point;

providing a track in adjacent relationship to said delivery point;

driving said parts from said tubular conduits outwardly by pushing them end to end toward said delivery point; and,

moving said parts along said track for subsequent processing from said delivery point.

4,288,024

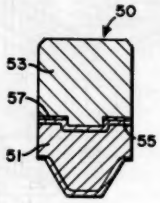
METHOD FOR MAKING A BIMETAL RESISTANCE WELDING ELECTRODE

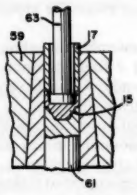
Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio

Continuation-in-part of Ser. No. 844,899, Oct. 25, 1977, abandoned, which is a division of Ser. No. 749,983, Dec. 13, 1976, Pat. No. 4,071,947. This application Nov. 13, 1978, Ser. No. 960,224

Int. Cl.³ H01B *13/00*; B23K *9/24*; B21D *39/00*

U.S. Cl. 228—155 **6 Claims**





1. A method of making a bimetal resistance welding electrode having a dispersion strengthened copper tip and a high conductivity copper shank, comprising:

(a) cutting a cylindrical rod of the desired quantity of dispersion strengthened copper material for the electrode tip, said rod including a cylindrical coating of high conductivity copper extending circumferentially therearound,

(b) upsetting said cylindrical rod along the axis thereof to form a generally cylindrical billet having a coating of high conductivity copper extending circumferentially therearound,

(c) upsetting said generally cylindrical billet in a direction perpendicular to the axis thereof to form an electrode tip member of extrusion diameter having a negative locator recess positioned in one end thereof and a coating of high conductivity copper covering substantially all of said one end of said tip member,

(d) forming a solid, high conductivity copper, cylindrical billet of extrusion diameter having a positive locator protrusion which is centrally positioned on one end thereof, said billet formed of the desired quantity of high conductivity copper for the shank of the electrode,

(e) placing together said electrode tip member and said high conductivity copper cylindrical billet with brazing compound therebetween, such that said protrusion and said recess mate,

(f) heating said electrode tip member, said high conductivity copper cylindrical billet, and said brazing compound such that said tip member and said high conductivity copper cylindrical billet are brazed together into a single extrusion blank having a tip portion formed of dispersion strengthened copper and a shank portion formed of annealed high conductivity copper, and

(g) back extruding said shank portion of said extrusion blank such that a high conductivity shank is formed while only partially back extruding said tip portion of extrusion

blank, thereby forming a full-hard bimetal electrode, whereby said coating of high conductivity copper prevents depletion of said brazing compound from the brazed joint between said tip member and said high conductivity copper cylindrical billet, and reduces the stress experienced by the brazed joint during extruding.

2. A method of making a bimetal resistive welding electrode of unitary construction having a tip portion formed of a dispersion strengthened copper and a shank portion formed of a high conductivity copper, comprising the steps of:

forming a tip member of dispersion strengthened copper having a high conductivity copper coating across a first end thereof,

forming a cylindrical billet of high conductivity copper,

brazing said cylindrical billet to said first end of said tip member using a brazing compound, at a temperature which does not anneal said dispersion strengthened copper, to form a bimetal extrusion blank having a tip portion formed of dispersion strengthened copper and a shank portion formed of annealed high conductivity copper, and

extruding said shank portion of said bimetal extrusion blank into a hardened electrode shank while only partially extruding said tip portion of said bimetal extrusion blank, thereby forming a full-hard bimetal electrode, whereby said high conductivity copper coating prevents depletion of said brazing compound from the brazed joint between said tip member and said cylindrical billet of high conductivity copper, and reduces the stress experienced by the brazed joint during extruding.

4,288,025

HOLLOW BEARER FOR VEHICLES AND METHOD FOR ITS MANUFACTURE

Willi Reidelbach, Sindelfingen; Hermann Renner, Magstadt, and Wolfgang Klie, Korntal, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

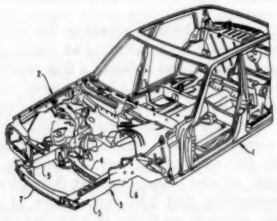
Division of Ser. No. 937,979, Aug. 30, 1978, abandoned, which is a division of Ser. No. 818,268, Jul. 22, 1977, Pat. No. 4,194,763.

This application Oct. 2, 1979, Ser. No. 81,181

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636655

Int. Cl.³ B21D *39/00*

U.S. Cl. 228—173 F **5 Claims**



1. A method of manufacturing a hollow longitudinal bearer for a motor vehicle body construction comprising the steps of subjecting a plurality of elongated sheet metal blanks to a localized treatment increasing the strength of transverse zones thereof relative to the strength of remaining untreated areas, and joining said blanks together along longitudinally extending surfaces to form said hollow longitudinal bearer, wherein a first of said blanks is deformed into a configuration having longitudinally extending flanges and wherein said joining step is performed by connecting the flanges of the first blank to the second blank in a manner defining a hollow space therebetween and exclusively within the treated areas of higher strength, with untreated areas of said blanks remaining unconnected.

4,288,026

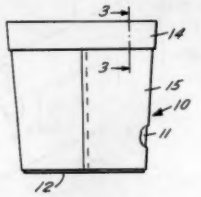
CONTAINER STRUCTURE

Thomas D. Wilhelm, Larsen, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Sep. 6, 1979, Ser. No. 72,911

Int. Cl.³ B65D *3/04*; B32B *23/08*

U.S. Cl. 229—1.5 B **8 Claims**



1. A container comprising: a sidewall portion of generally circular cross-sectional configuration and extending from a closed end portion to an open end portion thereof, said sidewall and said closed end portions being of seamless one-piece expanded polystyrene construction having a density of from about 1.5 to about 2.5 lbs./ft³, and having a thickness of from about 70 to about 100 mils; and a reinforcing band encircling said sidewall portion and firmly adherent thereto throughout a substantially circumferential band region thereof, said band comprising paper of from about 1 to about 2 mils thick and having a basis weight of from about 9 to about 20 lbs./ream.

4,288,027

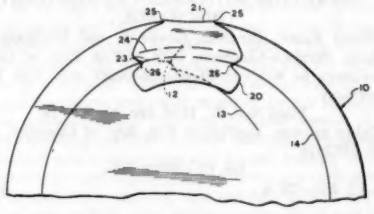
OPENABLE CARDBOARD LID FOR EXTENDABLE POPCORN PANS

David S. Peterson, Oak Lawn, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 20, 1979, Ser. No. 77,382

Int. Cl.³ B65D *5/64, 5/70*

U.S. Cl. 229—43 **3 Claims**

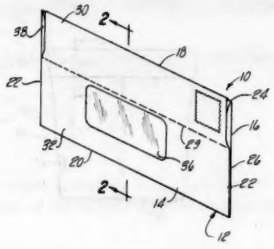


1. In an openable lid for use in connection with a popcorn pan covered with an expandable foil, said lid including an opening device in the form of curved score lines cooperating with an angular pulling tab, and a protective tab of a substantially semi-circular shape having a base line integral with a circumferential section of said lid, a cut-away top edge of a substantially semi-elliptical shape, a row of through-cuts extending along said base line, and two parallel rows of through-cuts extending substantially parallel to said cut-away top edge and being separated from the lateral edges of said protective tab, a combination comprising additional cuts in said protective tab extending between said lateral edges of the latter and at least one of said two rows of through-cuts to reduce the resistance of said protective tab against the expandable foil during expansion.

4,288,028
REMAILABLE ENVELOPE

Jose O. Diaz, 8711 Carpenter Rd., Milan, Mich. 48160

Filed Jan. 7, 1980, Ser. No. 109,545
Int. Cl.[3] B65D 27/06
U.S. Cl. 229—73 9 Claims

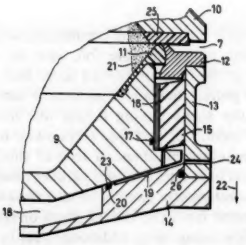


1. A remailable envelope comprising an envelope body having front and rear panels, each of said panels having top, bottom and side edges, means securing said panels together to form an envelope pocket, said front panel comprising upper and lower panel portions and being adapted to exhibit address indicia, said upper panel portion being foldable toward and away from a face-to-face relationship with said rear panel, a first closure flap connected to said upper panel portion at the top edge of said front panel for closing the mouth of said envelope pocket, a second closure flap connected to said rear panel and operable to overlie a substantial portion of said front panel during reuse of said envelope, said second flap being of a size sufficient to cover said front panel to overlie said address indicia and being adapted to exhibit a second address for remailing of the envelope, said second flap being folded upon itself and inserted in said envelope pocket during the first mailing of the envelope, said upper panel portion of said front panel being foldable away from said rear panel to expose said folded second panel for expeditious withdrawal thereof from said envelope pocket.

4,288,029
SEPARATOR WITH PRESSURE-RESPONSIVE DISCHARGE

Wolfgang Epper, Bergheim-Zievenich, and Wolfgang Heckmann, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Nov. 27, 1979, Ser. No. 97,714
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852628
Int. Cl.[3] B04B 1/14
U.S. Cl. 233—20 A 6 Claims



1. A separator for separating materials of different densities consisting of:

a rotational-symmetric separation vessel having at least one discharge aperture disposed on a circumference thereof;

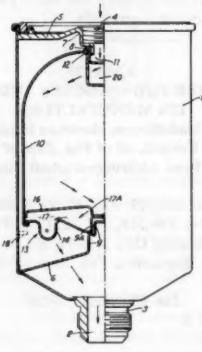
an annular sleeve spaced from said separation vessel and forming a piston valve in cooperation therewith having a chamber which is chargeable with a pressure medium and which surrounds the exterior of the separation vessel and normally blocks said discharge aperture;

a flexible connection element radially attached between the sleeve and the separation vessel, said connection element permitting limited uniform axial displacement of and guiding said sleeve to open and close said aperture, said connection element further having a selected flexibility to normally oppose interior pressure developed in said separator and to allow piston valve displacement and material discharge upon developement of a selected interior pressure.

4,288,030
CENTRIFUGAL SEPARATOR

Rodney T. Beazley, Downderry, and Mervyn T. Haggett, Thistledovine, both of England, assignors to The Glacier Metal Company Limited, Wembley, Great Britain

Filed Aug. 29, 1979, Ser. No. 70,617
Claims priority, application United Kingdom, Apr. 12, 1979, 12939/79
Int. Cl.[3] B04B 9/00
U.S. Cl. 233—23 R 11 Claims



1. In a disposable centrifugal separator for separating contaminants from oil used for lubricating an engine, said separator comprising shroud means defining a first chamber, bearing means within the shroud means, a hollow rotor rotatably carried by the bearing means, said hollow rotor defining a second chamber for receiving contaminated oil, inlet port means in said shroud means said port means being aligned with said bearing means and adapted to form a releasable connection with said engine, an inlet passage passing through said bearing means and connecting said inlet port means to said second chamber, means to rotate said rotor and thereby cause contaminants in the contaminated oil within said second chamber to migrate towards the sidewall of said second chamber under the influence of centrifugal force and to be separated from such contaminated oil, said means to rotate said rotor comprising outlet reaction port means on said rotor in fluid communication with said second chamber to cause said rotor to rotate upon discharge of fluid from said second chamber to said first chamber, partition means in said second chamber adjacent said outlet port reaction means dividing said second chamber into a centrifuging chamber and an outlet port chamber, said centrifuging chamber and said outlet port chamber being interconnected adjacent the rotary axis of the rotor, and outlet port means in said shroud means for discharging fluid from said first chamber, said outlet port means being adapted to form a releasable connection with said engine, the improvement which

comprises forming said bearing means as axially aligned stub axles and leaving said centrifuging chamber substantially unrestricted whereby oil entering said centrifuging chamber through said inlet passage immediately flows outwardly towards said sidewall under centrifugal force.

4,288,031

THERMOSTATIC CONTROL VALVE

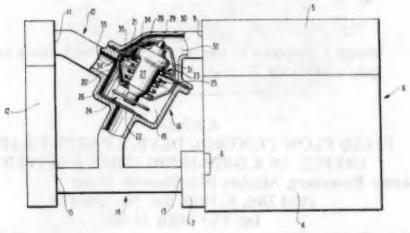
Jürgen Hass, Weinstadt, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 13, 1978, Ser. No. 968,922

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755464

Int. Cl.³ G05D *23/12*

U.S. Cl. 236—34.5 **14 Claims**



1. A thermostatic control valve for maintaining an essentially constant set value of an operating temperature of a liquid coolant conductible through a cooling jacket of an internal combustion engine, the thermostatic control valve including a first, second, and third valve connection, two of the valve connections being adapted to be connected to the cooling jacket with the remaining valve connection being adapted to be connected to a radiator means for dissipating heat of the liquid coolant, a valve chamber means open to the first valve connection, a first valve means for controlling a flow of liquid coolant between the second valve connection and the valve chamber means, and a second valve means for controlling a flow of liquid coolant between the third valve connection and the valve chamber means, a thermostatic adjusting means operatively connected with said first and second valve means, said adjusting means being movable in response to predetermined temperature changes, said first and second valve means being actuatable such that, in a lower temperature phase which extends up to a lower reference value of an operating temperature which is below a predetermined operating temperature value, one of said valve means is brought into a closed position blocking the valve chamber means from one of the valve connections so as to suppress the flow of liquid coolant to at least a partial area of the cooling jacket, and, in an upper temperature phase adjacent the lower reference value containing the predetermined operating temperature value, the other of said valve means permits at least a partial volume of liquid coolant from the cooling jacket to be conducted through the radiator means, the other valve means being adapted to be brought into a closed position at an upper reference value of the operating temperature which is above the predetermined operating temperature value so as to block off the valve chamber means from one of the valve connections thereby causing a total volume of liquid coolant from the cooling jacket to flow through the radiator means, characterized in that a spring means is provided for displacing said one of said valve means to the closed position so as to block the valve chamber means and suppress a flow of liquid coolant, means are provided for mounting the spring means at the valve chamber means, the other valve means is actuatable by said adjusting means, and in that one of the two valve connectons is adapted to be connected to a suction side of a coolant pump having a pressure side connected to the cooling jacket.

4,288,032

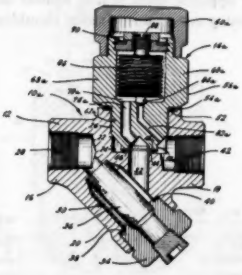
STEAM TRAP INCLUDING INTERCHANGEABLE BODY MEMBER AND INSERT ASSEMBLY

Heinz K. Hetz, Halicong, Pa., assignor to Yarway Corporation, Blue Bell, Pa.

Continuation-in-part of Ser. No. 629,649, Nov. 6, 1975, abandoned. This application Aug. 30, 1977, Ser. No. 829,008

Int. Cl.³ F16T *1/10*

U.S. Cl. 236—56 **15 Claims**



1. A steam trap comprising a body member and an insert assembly; said body member including a generally cylindrical recess extending inwardly from an outer surface thereof and terminating in an end face, said recess being formed with a threaded portion extending from adjacent said outer surface and terminating at a point spaced from said end face such that an unthreaded portion is formed between said threaded portion and said end face, said threaded portion and said unthreaded portion having a substantially uniform diameter, inlet and outlet passage means communicating with said recess, said inlet passage means including a passageway terminating in said end face of said recess, said outlet passage means including a passageway terminating in said unthreaded portion and said face of said recess, a seat formed in said outer surface of said body member and extending about said recess, and an annular rib formed on said end face around said inlet passageway, said annular rib having a seating surface located in said recess and spaced from said end face thereof; said insert assembly including means for preventing the flow of steam from said inlet passage means to said outlet passage means and for allowing the flow of condensate from said inlet passage means to said outlet passage means, said insert assembly further including a threaded portion engaged with said threaded portion of said recess for retaining said body member and said insert assembly in assembled relationship, first and second bearing surfaces included in said insert assembly, said first bearing surface being located in said recess adjacent said end face thereof and said second bearing surface being located externally of said body member adjacent said seat in said outer surface thereof; a first sealing ring clamped between said first bearing surface and said seating surface on said rib and a second sealing ring clamped between said second bearing surface and said seat in said outer surface of said body member.

4,288,033

CONTROL VALVE ASSEMBLY

Thomas W. Wisyanski, Terryville, Conn., assignor to Century Brass Products, Inc., Waterbury, Conn.

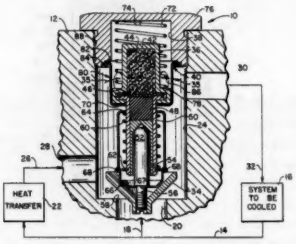
Continuation of Ser. No. 925,274, Jul. 17, 1978, abandoned. This application Apr. 9, 1980, Ser. No. 138,673

Int. Cl.³ G05D *23/12*

U.S. Cl. 236—93 A **4 Claims**

1. A temperature and pressure responsive fluid flow control

assembly comprising a temperature responsive valve actuator having a heat conductive casing containing a thermally expansible material, a housing having a chamber therein, the housing including a cup of stamped metal construction having an apertured end wall defining a first end wall of the housing and a side wall having openings therein defining side wall openings for the housing, said first apertured end wall of the housing serving as a seat for the valve actuator casing in a normal operating position, the valve actuator casing being received within the housing chamber for movement away from its normal operating position toward a second end wall of the housing opposite its said first end wall, an override spring urging the casing toward said normal operating position, the spring having opposite ends seated against said second end wall of the housing and against a radial shoulder formed on the



casing of the valve actuator, a tubular guide secured to the casing to extend from the chamber through said first apertured end wall of the housing, a piston slidably mounted within the guide and having an end projecting from the guide, said projecting end of the piston carrying a valve member for movement between closed and open positions, the valve actuator casing having an end extending beyond its said radial shoulder and surrounded solely by the coils of the override spring with the end of the valve actuator casing in spaced relation to a confronting side wall of the housing and its said second end wall in said normal operating position of the valve actuator to permit substantially frictionless movement of the casing away from its said normal operating position against the force of the override spring to balance fluid pressure force on the valve member for effecting pressure relief.

4,288,034

BOOM SHOCK AND TILT SYSTEM

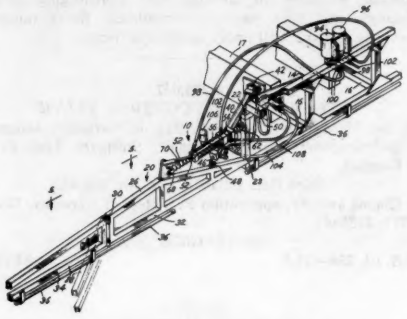
Gerald L. Widmer, Loda, Ill. 60948; Larry J. Gray, Loda, and Richard H. Pardee, Springfield, both of Ill., assignors to Gerald Widmer, Paxton, Ill.

Filed Mar. 19, 1979, Ser. No. 21,993
Int. Cl.³ B05B *1/20*
U.S. Cl. 239—168 **24 Claims**

1. In a spray boom assembly mountable on a vehicle for movement with the vehicle,

at least one boom,

shock absorbing means for absorbing shock imparted to said boom assembly in a direction substantially parallel to the direction of movement of the vehicle, said shock absorbing means including fluid circuit means for converting said shock to a force pivotally lifting said boom in a direction substantially perpendicular to the direction of said



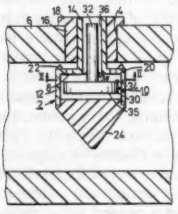
shock in response to the occurrence of said shock to dissipate said shock.

4,288,035

FLUID FLOW CONTROL DEVICE PARTICULARLY USEFUL AS A DRIP-IRRIGATION EMITTER

Avner Rosenberg, Moshav Beit Shearim, Israel

Filed Dec. 6, 1979, Ser. No. 100,979
Int. Cl.³ B05B *15/00*
U.S. Cl. 239—271 **15 Claims**



1. A fluid flow control device particularly useful as a drip-irrigation emitter, comprising a housing including a control member disposed within but unattached to the housing so as to be freely movable therein, said housing including a wall formed with an inlet opening and an outlet opening both facing the same side of said control member and located so as to be covered and uncovered by said side of the control member as the control member moves towards and away from said wall of the housing.

4,288,036

SPRAY GUN

Roland C. Jubinville, P.O. Box 150, Millet, Alberta, Canada T0C 1Z0

Filed Oct. 17, 1979, Ser. No. 85,552
Int. Cl.³ B05B *7/14*
U.S. Cl. 239—345 **8 Claims**

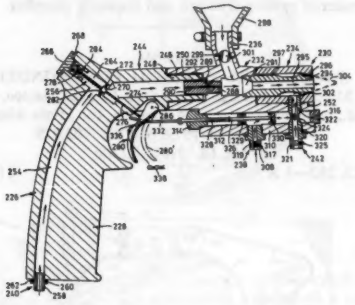
1. A spray gun adapted to simultaneously spray a liquid and a particulate material, the gun comprising:

a body defining a handle section;

a nozzle assembly coupled to said body and having: a central opening for the discharge of a stream of said particulate material; and liquid discharge means disposed around said opening for the discharge of liquid around said stream of particulate material;

said body including: a first air passageway having an inlet end, and an outlet end communicating with said central

opening of the nozzle assembly; means at said inlet end for coupling a source of pressurized air to said first air passageway; a second air passageway having an inlet end, and an outlet end coupled to said liquid discharge means of the nozzle assembly; means at said inlet end for coupling a source of pressurized air to said second air passageway; first inlet means disposed intermediate said inlet and outlet of said first air passageway and through which said particulate material can be introduced into said first air passageway; second inlet means disposed intermediate said inlet and outlet of said second air passageway and through which said liquid can be introduced under pressure into said second air passageway; and means in said first inlet means for controlling the introduction of said particulate material into said first air passageway;



a trigger mounted on said body adjacent said handle section for progressive movement with respect to said body from a rest position, said trigger being positioned so that it can be squeezed towards said handle section by a person holding the gun by said section;

spring means normally biassing said trigger to its said rest position; and,

an air flow control valve disposed in said first air passageway upstream of said first inlet means and coupled to said trigger so that the valve is progressively opened as the trigger is squeezed;

said second inlet means including a liquid flow control valve coupled to said trigger so as to be progressively opened as the trigger is squeezed;

whereby the volume of liquid and the amount of particulate material issuing from the gun can be simultaneously varied in use by operation of the trigger.

4,288,037

FUEL INJECTION VALVE

Peter Schelhas, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 3, 1979, Ser. No. 99,281

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1979, 2900847

Int. Cl.³ B05B *1/34*

U.S. Cl. 239—434.5 **6 Claims**

1. A fuel injection valve comprising:

a valve housing, said housing having therein;

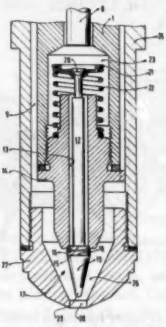
an air conduit connected to an air chamber;

a fuel conduit connected to a fuel chamber;

a fuel injection nozzle opening;

a bore in said valve housing extending between said air chamber and said fuel chamber connecting said fuel chamber with said air chamber; a valve seat on the end of said bore extending into said air chamber;

a valve needle extending through said bore in said valve housing, said valve needle comprising a conical section valve seat engaging portion and a smooth tapered end portion tapering toward said fuel injection nozzle opening, said conical section valve seat engaging portion being positioned to engage the valve seat of said valve housing to close said bore against fuel flow, said tapered end portion being positioned centrally over said fuel injection nozzle opening in said housing and extending into said air chamber; and



resilient means connected between said valve needle and said valve housing, said resilient means urging said valve needle in a direction toward said valve seat; whereby actuation of said valve needle in a direction relative to said valve seat controls fuel flow therethrough and along said tapered end portion of said valve needle into said air chamber.

4,288,038

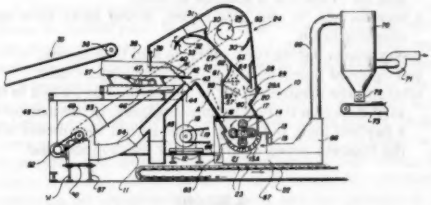
WASTE MATERIAL PROCESSING APPARATUS

Robert M. Williams, 16 La Hacienda, Ladue, Mo. 63124

Filed Dec. 17, 1979, Ser. No. 104,750

Int. Cl.³ B02C *13/288*

U.S. Cl. 241—52 **10 Claims**



1. Waste material processing apparatus comprising: material reducing mill means having an outlet for reduced material; a waste material receiving chamber for directing waste material toward said mill means, said mill means operating to agitate the waste material and create a circulating flow thereof in said chamber during reduction thereof; and operable means mounted in said chamber in advance of said mill means and responsive to the waste material being circulated by said mill means, said operable means including a first gate means normally movable in a direction for admitting waste material to said mill means, and second gate means movable in a direction to release waste material circulated from said mill means, said first and second gate means operating to confine waste material to be reduced by said mill means and responding to the circulating flow thereof, so that said first gate means limits the quantity of waste material released to said mill means by withholding waste material in response to the back pressure of the flow of waste material being acted on by said mill means and said second gate means releases waste material back to said chamber for unloading said mill means of excess and hard to reduce waste material.

4,288,039

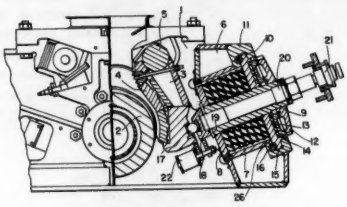
SINGLE-ROLL CRUSHER

Eberhard Waskow, Minden, Fed. Rep. of Germany, assignor to Weserhütte Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 959,296, Nov. 9, 1978, abandoned. This application Feb. 12, 1980, Ser. No. 120,808

Int. Cl.³ B02C *1/08*

U.S. Cl. 241—198 A **2 Claims**



1. In a single-roll crusher having a housing, a roll body freely rotatably supported on an eccentrically rotatable drive shaft in said housing, at least one laterally mounted crushing beam pendularly suspended in the upper part of said housing and being positioned at approximately the height of the roll body axis by means of a clamping bolt against a prestressed set of springs including a plurality of springs clamped between a front spring seat and a rear support disc, the set of springs, in turn, being supported by means of the support disc against said housing,

whereby when crushing forces acting on said prestressed set of springs exceed a prestressing force, the springs are further compressed and said clamping bolt and said front spring seat are displaced in said housing away from said crushing beam,

the improvement comprising base means on the crusher housing adapted to support said rear support disc,

said base means having an aperture therein through which said set of springs is adapted to pass,

a stop surface, in said base means, facing away from said crushing beam,

prong means, facing each other, in said base means,

and opposed prong means on said rear support disc,

whereby the prestressed set of springs can be locked in the axial direction thereof by interengaging, in the manner of a bayonet lock, the prong means in said base means with the opposed prong means on said rear support disc.

4,288,040

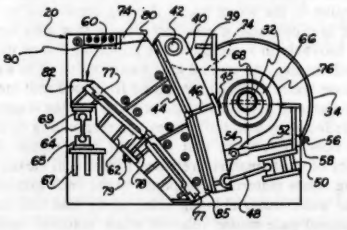
LOW PROFILE CRUSHING APPARATUS

Harold J. Miller, Galion, Ohio, assignor to Eagle Crusher Company, Inc., Galion, Ohio

Continuation-in-part of Ser. No. 904,906, May 11, 1978, abandoned. This application Jan. 9, 1980, Ser. No. 110,708

Int. Cl.³ B02C *1/04*

U.S. Cl. 241—263 **4 Claims**



1. An improved low profile crushing apparatus for mine ore or hard rock comprising, in combination, a base means; a first crushing jaw means mounted in a releasably fixed position on said base in a vertically inclined position; a second crushing jaw means mounted on a support means and disposed below and spaced from said first jaw means in a similarly vertically inclined position to define a crushing chamber between said respective jaw means, said support means including a supporting toggle arrangement near its upper end mounted on said frame means; eccentric drive means mounted on said frame means and operatively connected to the upper and lower ends of said support means carrying said second jaw means to impart repetitive predetermined motion to said second jaw means relative to said first jaw means; feeding means mounted adjacent to said crushing chamber and means mounted adjacent to the lower end of said crushing chamber to collect and transport material passing through said crushing chamber.

4,288,041

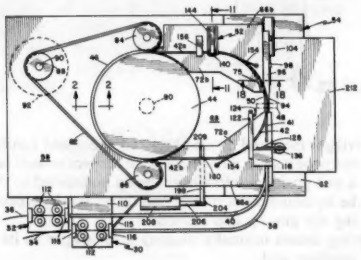
SHUTTLELESS TOROIDAL CORE WINDER

Willy Marzec, San Diego, and James D. Lint, Santee, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 10, 1979, Ser. No. 101,829

Int. Cl.³ H01F *41/08*

U.S. Cl. 242—4 R **11 Claims**



1. An apparatus for winding a wire having a leading end from a continuous source onto a core having a central opening, comprising:

a drum having an annular outer surface;

means for mounting the drum for rotation about its central axis;

endless belt means for engaging a portion of the annular outer surface to rotate the drum;

means for defining a curved wire receiving channel extending generally perpendicular to the drum axis, the channel having a pair of open ends positioned adjacent the annular outer surface of the drum, a width and a height sufficient to accommodate a predetermined number of vertically stacked lengths of the wire, and a gap therein;

gap crosser means for selectively bridging the gap to complete the channel;

core feeding means for supplying and supporting the core in the gap so that the gap crosser means can extend through the core opening; and

wire feeding and braking means for guiding the leading end of the wire into the channel and around the drum during rotation thereof to form the wire into a coil having the predetermined number of vertically stacked loops, the coil being frictionally held between the drum and the belt means and positively driven thereby to circulate it in the channel through the core opening, and further for selectively braking and rigidly holding the trailing end of the wire,

whereby when the trailing end of the wire is braked and held as the coil is circulated, the loops will successively peel radially inwardly out of the channel and from between the

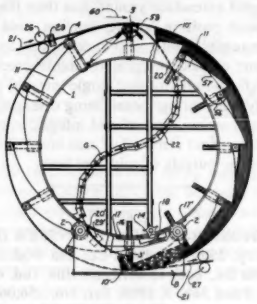
drum and the belt means and will wind into turns about the core.

4,288,042

VARIABLE CAPACITY STRIP ACCUMULATOR ROTATABLE ON A HORIZONTAL AXIS

Tadeusz Sendzimir, 269 Brookside Rd., Waterbury, Conn. 06720

Filed Sep. 11, 1979, Ser. No. 74,415
Int. Cl.³ B65H *17/48*
U.S. Cl. 242—55 **21 Claims**



1. The method of transiently storing a variable length of strip material on two adjacent spiral coils rotating on a common horizontal axis with the convolutions of the coils wound in opposite directions, comprising

(a) winding the incoming strip of material into one coil and withdrawing the strip from the other coil while the connection between the inner portions of the two coils moves in opposite directions in response to the relative preponderance of the rate of accumulation and exhaustion of the strip of material from the coils as they increase and decrease in diameter,

(b) supporting the inner periphery of each of the spiral coils with a plurality of circumferentially displaced supporting rollers which permit sagging of the strip between adjacent rollers in their elevated orbit and the consequent freedom of movement and creeping between the juxtaposed windings of the strip material, and

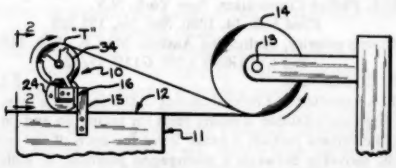
(c) adjusting the circular orbit of the supporting rollers in conformity with the variation of the diameters of the inner peripheries of the spiral coils to maintain the support of the innermost windings of the coils and the resultant sagging and creeping effects of the strip material for all thicknesses of said spiral coils.

4,288,043

MEASURING TAPE DISPENSER

Andrew C. Bohnengel, Sylvania, Ohio, assignor to The Perfect Measuring Tape Company, Toledo, Ohio

Filed Apr. 18, 1980, Ser. No. 141,355
Int. Cl.³ B65H *75/02*
U.S. Cl. 242—55 **5 Claims**



1. Mechanism for dispensing measuring tape into the wraps of a length of cloth that is being wound onto a mandrel, said mechanism comprising, in combination,

(a) a frame extending transversely to the length of the cloth,

(b) a horizontally extending guide on said frame,

(c) a carriage mounted for movement along said guide,

(d) a rotatable shaft mounted on said frame for reciprocating said carriage back and forth along said guide,

(e) means on said carriage engaged with said shaft,

(f) an arm on said carriage which extends radially away from said shaft,

(g) means on the outer end of said arm for individually replaceably mounting each of two rolls of measuring tape, and

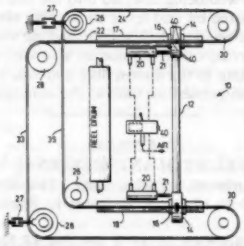
(h) a drive wheel fixed on the end of said shaft to rotate the latter in response to movement of a length of cloth being wound.

4,288,044

PAPER REEL SYNCHRONIZING SYSTEM

Robert Greding, Beaconsfield, Canada, assignor to Dominion Engineering Works Limited, Quebec, Canada

Filed Nov. 15, 1979, Ser. No. 94,448
Int. Cl.³ B65H *23/02*
U.S. Cl. 242—67.1 R **1 Claim**



1. In a paper reeling system having a rotatably mounted reel drum for reeling paper thereon, a removable reel bar for applying pressure against a roll being reeled on said drum and incorporating end bearings, each said bearing detachably mounted on a carriage; a rotatably mounted reel drum; a pair of tracks extending substantially normally to the drum in spaced apart relation, each having a said carriage mounted in sliding relation thereon; an air cylinder adjacent each track attached to a respective said carriage to displace the carriage along the track, including air admission control means for selectively admitting air simultaneously to each said air cylinder in an advancing or a retracting sense; mechanical synchronizing means interconnecting the two said carriages including substantially inextensible cable means looped in tensioned relation as an endless loop arranged to maintain the carriages in substantially mutually parallel relation, and lost motion means interconnecting said cable means and one said carriage to permit limited skewing of said reel bar relative to said drum in roll building operation.

4,288,045

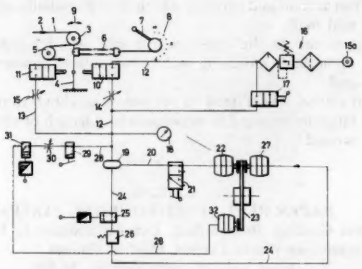
DEVICE FOR CONTROLLING THE TENSION OF A WEB

Werner Römhild, Landau, Fed. Rep. of Germany, assignor to Tidland GmbH, Ahaus, Fed. Rep. of Germany

Filed Dec. 20, 1979, Ser. No. 105,736
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855591; Dec. 22, 1978, 2855592
Int. Cl.³ B65H *59/00*
U.S. Cl. 242—75.53 **4 Claims**

1. Device for controlling the tension of a web discharged from a delivery spool including a compensating roller around which said web is guided to which a tiltingly supported lever is connected the deflection of which influences a pneumatic

valve, which provides, in a compressed-air line system including a reduction valve, for the pneumatic pressure of a brake cylinder of a pneumatic brake of a machine processing said web, wherein said lever is engaged by a tension spring with adjustable stroke and said lever is tiltable between two end switches, which actuate valves including series-connected reduction valves inserted into one pneumatic line each, both



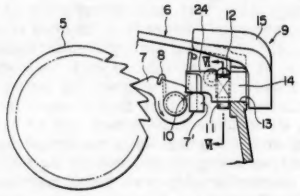
being connected to a compressed-air tank, which actuates said brake cylinder, the valve actuated in case of a decrease of the tension of said web being inserted into the line under pressure and when actuated by said lever connecting said compressed-air tank to the compressed-air source, and the valve actuated in case of an increase of the tension of said web being inserted into a line leading to the atmosphere and when actuated connecting said compressed-air tank to the atmosphere.

4,288,046

SPINNING REEL WITH ANTI-REVERSAL MECHANISM

Yoshinori Morimoto, Fuchu, and Takehiro Kobayashi, Fukuyama, both of Japan, assignors to Ryobi, Ltd., Fuchu, Japan

Filed Oct. 25, 1979, Ser. No. 88,220
Claims priority, application Japan, Nov. 6, 1978, 53-153235
Int. Cl.[3] A01K *89/01*; F16D *63/00*
U.S. Cl. 242—84.21 R **7 Claims**



1. In a spinning reel including a rotor, a reel body, a drive gear rotatably mounted in said reel body, a pinion gear engaged with said drive gear and connected to said rotor, an an anti-reversal mechanism which includes a ratchet gear integrally and coaxially provided with said drive gear, a stop pawl pivotally secured to said reel body and normally biased by a bias spring so as to engage said ratchet gear and prevent reverse rotation of said rotor, and switching means movable between at least a first position in which said pawl is permitted to engage said ratchet and a second position in which said pawl is held out of engagement with said ratchet, the improvement characterized in that said switching means comprises:

a depressing portion rotatable between a first position in which said pawl is permitted to engage said ratchet and a second position in which it holds said pawl out of engagement with said ratchet gear;

a position setting portion;

a shaft portion rotatably supported by said reel body;

a thumb lever for rotating said depressing portion; said thumb lever, shaft portion, position setting portion and depressing portion all being formed in a single integral rotatable member and the diameters of each of said depressing portion and position setting portion being no larger than the diameter of said shaft portion whereby said depressing portion and position setting portion can be inserted into said reel body from the outside thereof;

spring means fixedly secured to the interior of said reel body and engaging said position setting portion to maintain the rotational position of said depressing portion; and

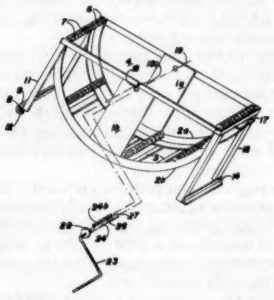
at least one indentation in the surface of said position setting portion and extending around less than the entire periphery of said position setting portion, said spring means being engagable with said indentation to prevent axial movement of said integral rotatable piece and thereby prevent disassembly of said single integral piece from said reel body, said spring means being disengagable from said indentation by rotation of said integral rotatable member to thereby permit removal of said integral rotatable member from the outside of said reel body.

4,288,047

FIREHOSE REEL AND TRANSFER DEVICE

Doyle R. Berry, 2509 Woodland Ct., and Walter S. Elder, 821 Morningside Dr., both of Jeffersonville, Ind. 47130

Filed Jun. 3, 1980, Ser. No. 156,069
Int. Cl.[3] B65H *75/38*
U.S. Cl. 242—86 **4 Claims**



1. A hose reel and transport device including first and second generally parallel wall means of generally semicircular peripherial configuration disposed in aligned relation, bracket means extending between the first and second wall means along a portion of the length of the periphery thereof to form a hose receiving chamber, at least two roller means located adjacent the periphery of the wall means and disposed to extend across the chamber between the first and second wall means.

4,288,048

CASSETTE

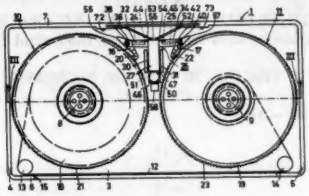
Joannus H. F. C. Sieben, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1980, Ser. No. 121,338
Claims priority, application Austria, Mar. 6, 1979, 1694/79
Int. Cl.[3] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—198 **5 Claims**

1. A cassette for a record carrier in the form of a tape, comprising two rotatable winding reels for taking up and unwinding the record carrier; a brake lever for each of the winding reels, movable between a disengaged position, in which the brake lever is disengaged from the associated winding reel, and a braking position, in which the brake lever cooperates with the associated winding reel so as to brake said reel, the brake

lever rotating the associated winding reel in a winding direction through a limited angle; and resilient means for moving each brake lever from its disengaged position to its braking position,

comprising in addition a lever mount for the two brake levers, means for mounting the lever mount for movement between a rest position and an operating position, and means for moving the mount actuable from outside the



cassette, the two brake levers being each journalled on said mount so as to be pivotable between their braking positions and their disengaged positions, and

at least one control surface in the cassette for the brake levers, arranged such that during the movement of the lever mount from its rest position to its operating position, said surface cooperates with said brake levers to pivot said levers to their disengaged positions.

4,288,049

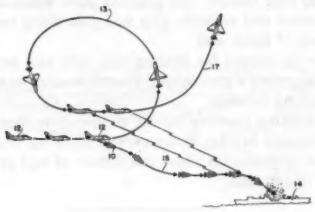
REMOTE TARGETING SYSTEM FOR GUIDED MISSILES

Frederick C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 19, 1971, Ser. No. 112,494

Int. Cl.³ F41G *7/28*

U.S. Cl. 244—3.14 **5 Claims**



1. In a remote target system for guided missiles, the combination comprising:

(a) a radar located at a remote station for detecting and tracking a target,

(b) a self-propelled guided missile launched from said remote station on a course established by said tracking radar,

(c) said guided missile having seeker means for detecting and tracking said target,

(d) a guidance data transfer unit coupled to said missile seeker for transferring guidance data between said missile seeker and said tracking radar,

(e) said missile seeker being responsive to guidance information received from said tracking radar for acquiring and locking-on said target in a homing mode,

(f) said guidance data transfer unit including a control switching unit for transferring guidance information supplied for the guidance of said missile from the pre-established course to guidance information supplied by said missile seeker in response to a command signal from said tracking radar.

4,288,050

STEERING DEVICE FOR MISSILES

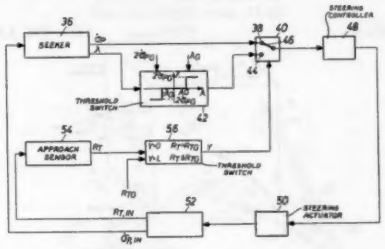
Roland Gauggel, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Geratetechnik GmbH, Uberlingen, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,672

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2830502

Int. Cl.³ F41G *7/00*

U.S. Cl. 244—3.16 **3 Claims**



1. A missile steering device for directing a steering controller of a missile to cause the missile to fly to intercept an airplane in flight, wherein the steering device includes target seeker means continuously directed towards a target having a positional relationship with respect to said airplane and producing a sight line rate signal (σ_P) proportional to the rate of change in space of the sight line to said target, said steering device being characterized by:

said target seeker means also producing a "look angle" signal (λ) representing the angular difference between the longitudinal axis of the missile and the optical axis of the seeker means;

threshold switch means connected to said seeker means to receive said look angle signal and producing an output signal of a corresponding sign when the look angle signal exceeds or falls below respective threshold values ($+\lambda_G$ and $-\lambda_G$);

approach sensor means for producing an output signal (R_T) representing the distance between the missile and the airplane; and

circuit means connecting the threshold switch means, the approach sensor means, the steering controller to receive said output signals and produce a lead signal for the controller to deflect the trajectory of the missile towards a point offset, along the path of the airplane, and in the direction of the airplane velocity vector (V_T), with respect to said target, when the distance between the missile and the airplane are less than a given magnitude and the look angle is greater than said respective threshold values.

4,288,051

METHOD AND APPARATUS FOR CONTROLLING A SATELLITE

Wilhelm Göschel, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 832,791, Sep. 12, 1977, abandoned. This application Apr. 19, 1979, Ser. No. 31,526

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1976, 2642061

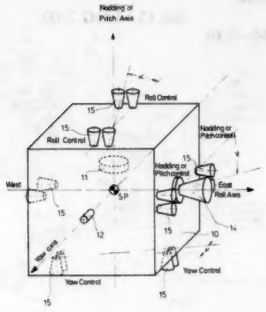
Int. Cl.³ B64G *1/24, 1/26, 1/28, 1/36*

U.S. Cl. 244—164 **17 Claims**

1. A method for attitude control and trajectory change of a satellite having a mission encompassing a transfer phase wherein said satellite is spin-stabilized and a latter phase wherein said satellite is three-axis stabilized, said satellite having a momentum wheel, an attitude control system and propulsion means, said method comprising the steps of:

activating said momentum wheel at the latest in the transfer phase of the mission;

rotating said satellite about an axis of the satellite which is parallel to the spin axis of the momentum wheel with a smaller angular momentum than that of said momentum wheel during said spin-stabilization phase;



substantially changing the trajectory of said satellite from said transfer phase to a substantially different trajectory and stabilizing said satellite along three axes at the moment of said changing of trajectory; and

selecting the thrust of said propulsion means to be effective to maintain proper satellite attitude during said changing of trajectory and for a period of three-axis stabilization after said trajectory is changed.

4,288,052

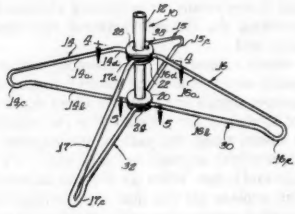
BASE FOR FREE STANDING MERCHANDISER

George B. Scott, 1727 Crystal La., Apartment 411, Mount Prospect, Ill. 60056

Filed May 24, 1979, Ser. No. 42,030

Int. Cl.³ F16M *11/32*

U.S. Cl. 248—188.6 **11 Claims**



1. A collapsible support stand being erectable into a locked position, said stand comprising a central support shaft, four legs having outer ends for engaging the floor and inner ends for attachment to said shaft,

each of said legs having an upper segment and a lower segment extending from said outer ends toward said support shaft,

a first upper support mounted on said shaft for axially sliding movement,

inner ends of one pair of legs attached to said upper support,

a lower support mounted on said shaft and movable axially along said shaft,

inner ends of a pair of legs secured to said lower support,

and detent means formed on at least one of said supports having an axially directed opening for receiving therein the inner ends of the other set of legs, said inner ends snapping into said detent openings when they are rotated into aligned and detenting position in which the legs are in said openings and are held by said detent means against rotation therefrom,

said detented leg ends being removable from said detent openings by being moved axially and then turned therefrom to allow the pairs of legs to be swung toward each other to collapse the stand.

4,288,053

ADJUSTABLE SIGN MOUNTING BRACKET

Robert Sarkisian, 4276 Stoneleigh Rd., Bloomfield Hills, Mich. 48013

Filed Jun. 20, 1979, Ser. No. 50,453

Int. Cl.³ E04G *3/00*

U.S. Cl. 248—218.4 **2 Claims**

1. A bracket for mounting a sign on a pole, said bracket comprising

a first section for fastening said bracket to said pole, said first section comprising a U-shaped bracket positioned around the pole and connected to a backing member, a gripping plate movably disposed inside said U-shaped bracket, and a handle adjustably mounted on said U-shaped bracket and attached to said gripping plate for moving said plate relative to said U-shaped bracket and securely holding said pole therein, said gripping plate being configured to contact and securely grip said pole along two elongated lines of force, and

a second section for holding said sign, said second section comprising a generally C-shaped bracket attached to said backing member

said backing member having an aperature therein and said C-shaped bracket being curved allowing access through said aperature to allow attachment of said gripping plate to said handle.

4,288,054

DOOR CLOSER MOUNTING ARRANGEMENT

Gerhard Schröder, Tiefenbronn, and Fritz Feucht, Renningen, both of Fed. Rep. of Germany, assignors to Vereinigte Baubeschlagfabriken Gretsch and Co., GmbH, Leonberg, Fed. Rep. of Germany

Filed Aug. 11, 1978, Ser. No. 932,857

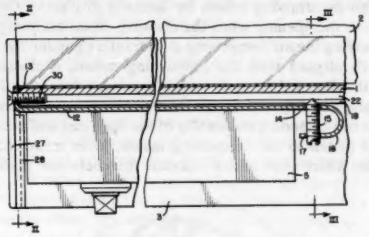
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736665

Int. Cl.³ E04G *5/06*; F16M *1/00*

U.S. Cl. 248—225.1 **30 Claims**

1. An arrangement for mounting a door closer to a stationary or movable door frame having a channel rail, characterized in that the channel rail is provided with longitudinally extending undercut grooves, the undercut grooves form transversely extending guide means, means are provided for suspending the door closer at the channel rail, at least a portion of said suspending means is adapted to be received in the undercut grooves behind the transversely extending guide means, and means adapted to be supported at the door closer are provided for alignment with an end face of the channel rail for exact

positioning of the door closer along the channel rail and for pressing said suspending means against said transversely ex-



tending guide means so as to securely position the door closer relative to the channel rail.

4,288,055

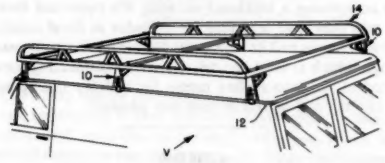
MOUNTING BRACKET

William E. Gump, 12114 SE. 19th, Milwaukie, Oreg. 97222

Filed Mar. 31, 1980, Ser. No. 135,524

Int. Cl.³ E04G *5/06*

U.S. Cl. 248—226.1 **7 Claims**



1. A mounting bracket for clampingly being clamped onto a drip gutter of a vehicle, comprising:

first leg means and second leg means disposed at right angles to one another, said first leg means being disposable within the drip gutter;

third leg means extending between said first and second leg means defining a brace therebetween;

said first leg means has a slot therethrough and a free end of said third leg means extends through said slot and extends beyond said first leg means therely defining base means;

clamping-plate means movably mounted along said first leg means including an inwardly-directed projection extending along the bottom of said first leg means and engagable with a bottom outside surface of the drip gutter; and

securing means provided between said first leg means and said clamping-plate means and between said base means and said clamping-plate means for clampingly securing said inwardly-directed projection against the bottom outside surface of the drip gutter and said clamping-plate means against the side of the drip gutter.

4,288,056

DEVICE FOR SETTING THE DIRECTION AND/OR THE INCLINATION OF AN ELONGATED ROCK DRILLING APPARATUS

Claes-Gustav Bergström, Saltsjöbaden, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

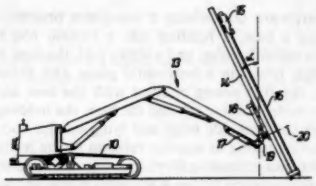
Continuation-in-part of Ser. No. 897,515, Apr. 18, 1978. This application Oct. 26, 1979, Ser. No. 88,625

Claims priority, application Sweden, Oct. 27, 1978, 7811159

The portion of the term of this patent subsequent to Jun. 23, 1998, has been disclaimed.

Int. Cl.³ E21C *1/00, 35/06*

U.S. Cl. 248—542 **6 Claims**



1. A rock drilling apparatus comprising:

a carrier (**10, 13**);

a feed beam (**14**) pivotally mounted to said carrier so as to be pivotable in a first plane about a first axis (**19**) and to be pivotable in a second plane about a second axis (**20**) that is at right angles to said first axis (**19**);

a rock drill (**15**) movable along said feed beam and arranged to drill a hole that is parallel with said feed beam;

first power means (**17**) coupled to said feed beam (**14**) to effect swinging of said feed beam about said first axis;

second power means (**18**) coupled to said feed beam (**14**) to effect swinging of said feed beam about said second axis;

a first member (**25**) affixed to said feed beam (**14**);

a second member (**23,12**) universally pivotably but non-rotatably carried by said first member (**25**);

indicating means (**21, 22**) affixed to said second member (**23, 12**) for indicating when an axis of said second member (**23**) is vertical;

means (**29**) for adjustment of said second member (**23**) relative to said first member (**25**) in order to adjust the angle between said axis of said second member (**23**) and an axis that is parallel with said feed beam (**14**); and

means (**26,34**) coupled to said second member (**23**) for swinging said second member about said axis that is parallel with said feed beam such that said axis of said second member (**23**) follows a conical path about said axis that is parallel with said feed beam;

said indicating means (**21,22**) comprising:

a first indicating device (**21**) arranged to indicate movements of said feed beam (**14**) in said first plane irrespective of the actual relative position between said first and second members (**25** and **23**, respectively); and

a second indicating device (**22**) arranged to indicate movements of said feed beam (**14**) in said second plane irrespective of the actual relative position between said first and second members;

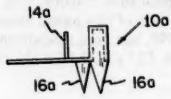
each of said first and second devices (**21,22**) comprising a pair of screens (**41,47**), one of said screens (**47**) being fixed with respect to said second member (**23,12**), and the other of said screens (**41**) being pivotable and biased to take up a predetermined position relative to the vertical, said pair of screens (**41,47**) forming an interference pattern that visually indicates the position of said second member (**23,12**) relative to the vertical.

4,288,057

CURTAIN AND WINDOW SHADE HARDWARE

Arthur W. Sainsbury, Jr., 103 Pine St., South Easton, Mass. 02375

Filed Nov. 2, 1979, Ser. No. 90,549
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—546 **1 Claim**



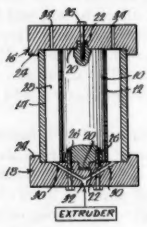
1. Hardware comprising a one-piece bracket, the bracket including a base, a holding tab, a curtain rod hook, a first prong, a second prong, and a strike pad, the base having a first side edge, lying on a horizontal plane and having an upper surface, the first prong integral with the base and in angular relation to the holding tab and the base, the holding tab extending from the first side edge and lying on the horizontal plane and the first prong in angular relation to the horizontal plane, the strike pad extending from the upper surface of the base in right angle relation to the horizontal plane, the second prong extending from the base toward the same direction as and in spaced parallel relation to the first prong and the curtain rod hook extending from the base in a direction away from the first prong.

4,288,058

COMPOSITE MOLD FOR MAKING RUBBER COVERED ROLLS AND METHOD FOR MAKING SAME

Hubert W. Inman, North Charleston, S.C., assignor to Raybestos-Manhattan, Inc., Trumbull, Conn.

Filed Sep. 17, 1979, Ser. No. 76,403
Int. Cl.³ B28B *7/34*
U.S. Cl. 249—134 **7 Claims**



1. A method for making a cylindrical mold comprising the steps of disposing a flexible tube of heat shrinkable polymeric material around a rigid cylindrical mandrel, disposing said tube covered mandrel in concentric relation within a rigid cylindrical shell having an inner diameter greater than the outer diameter of the tube covered mandrel, injecting a curable elastomer under pressure between the tube and the shell until any space therebetween has been filled, curing the elastomer to form a continuous elastomer layer bonded between said shell and said tube, and then removing the mandrel.

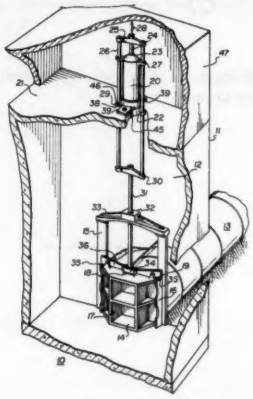
4,288,059

SLUICE GATE

Florian Gurbin, 331 Irwin Ave., Essex, Ontario, Canada N8M 2T7

Filed Oct. 17, 1979, Ser. No. 85,916
Int. Cl.³ F16K *31/122*
U.S. Cl. 251—58 **7 Claims**

1. In a sluice gate apparatus including drawing means energizable to operate the apparatus, a gate disc adapted to open and close a gate opening, frame means defining the gate opening, including guide means adapted to retain the disc in slidable relation with respect to said opening, means connecting the disc with the drawing means for laterally displacing the disc relative to the opening when the drawing means are energized, said drawing means comprising a hydraulic cylinder having a long axis aligned with the connecting means, a closed end facing the disc and an open end facing away from the disc, a piston slidably disposed within the cylinder along said axis and a piston rod extending outwardly of the open end and connecting said piston to the connecting means, lever means having long and short ends and a fulcrum therebetween pivotably



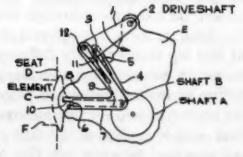
connected to the disc, the short end being disposed to bear against a fixed portion of at least one of the guide means and said frame when the disc is in closed relation with the opening, and the long end being connected to the connecting means to obtain a mechanical advantage in drawing pressure when displacing the disc to a partially open position, an improvement comprising a bulkhead isolating the open end from the disc, said bulkhead retaining the cylinder in fixed relation to the frame means and having walls defining at least one passage through which at least one tail rod of the connecting means is adapted to pass and sealing means for slidably sealing said at least one tail rod in said at least one passage.

4,288,060

SEQUENCED DRIVE FOR ROTARY VALVES

Larry C. Mittell, Palos Verdes Estates, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 21, 1979, Ser. No. 106,130
Int. Cl.³ F16K *31/44, 31/12*
U.S. Cl. 251—215 **5 Claims**



1. A sequenced drive mechanism for producing linear and rotary motions in rotary valves having a housing within which is located a seat and a sealing element movable with respect to the seat, said sequenced drive mechanism comprising a first

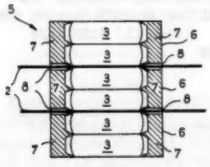
link adapted to be connected at one end thereof to a driving means and having a pair of spaced cam followers secured at the other end thereof, a first shaft, a second link having one end thereof connected to said first shaft and having a longitudinally extending slot in the other end thereof, one of said pair of spaced cam follows being located within said slot, a second shaft in offset coaxial arrangement with respect to said first shaft and operatively connected to said sealing element, a third link having a pair of angularly spaced, outwardly extending arms secured to said second shaft, one of said arms having an open slot in the outer end thereof and adapted to cooperate with a third cam follower fixedly secured to said valve housing, the other of said arms having a longitudinally extending slot therein having two sections of which one section is wider than the other, the other of said pairs of spaced cam followers being located within said last mentioned slot, such that initial rotation of said first link in one direction moves said second link causing rotation of said first shaft without rotation of said second shaft resulting in a translating of said sealing element in a direction substantially perpendicular with respect to said seat and moving said third link with respect to said third cam follower, and further rotation of said first shaft moves said third link causing rotation of said second shaft which produces rotation of said sealing element with respect to said seat.

4,288,061

SAFETY BARRIER WHICH IS ESPECIALLY USEFUL FOR MOTORWAYS

Joël P. Moreau, 62, rue Paul Bert, 92150 Suresnes, France

Filed May 9, 1979, Ser. No. 37,382
Claims priority, application France, May 9, 1978, 78 13628
Int. Cl.³ E04H *17/00*
U.S. Cl. 256—13.1 **10 Claims**



1. A safety barrier comprising a plurality of modules coupled to one another by at least one embedded linear element under tension, said modules each being composed of an integral material subject to bursting as a result of internal tension due to said linear element passing through the modules and embedded therein so that any module struck by a car involved in an accident bursts together with adjacent modules and a flexible casing surrounding each module and preventing ejection of debris and fragments of materials upon impact and bursting of the module.

4,288,062

APPARATUS FOR CONTROL AND MONITORING OF THE CARBON POTENTIAL OF AN ATMOSPHERE IN A HEAT-PROCESSING FURNACE

Bhupendra K. Gupta, Canton; Paul K. Shefsiek, Farmington, both of Mich., and Freeman W. Fraim, Lexington, Mass., assignors to Holcroft, Livonia, Mich.

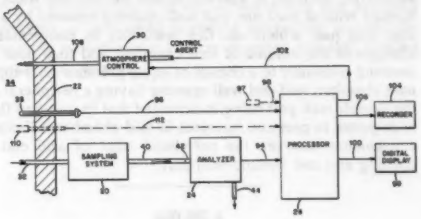
Filed Aug. 9, 1979, Ser. No. 65,308
Int. Cl.³ C21D *11/00*
U.S. Cl. 266—88 **3 Claims**

1. Apparatus for monitoring and control of the carbon potential in the atmosphere of a heat processing furnace comprising:

means for measuring the temperature of said atmosphere and for producing a temperature signal;

sampling means for withdrawing from the furnace a sample of said atmosphere;

an infrared analyzer connected to said sampling means outside of said furnace for receiving and analyzing said sample; said analyzer including means for producing a CO_2-absorbed electrical signal indicative of the partial pressure of carbon dioxide of said sample and a CO-absorbed electrical signal indicative of the partial pressure of carbon monoxide of said sample;



a microprocessor electrically connected to said infrared analyzer and to said temperature measuring means, said microprocessor operable to calculate a carbon potential signal from said temperature signal and said CO_2-absorbed and CO-absorbed electrical signals; and

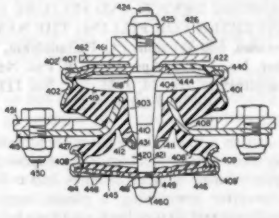
control means for comparing said calculated carbon potential signal with a predetermined desired value of carbon potential and adjusting the flow of a control agent to said furnace to minimize the difference between said desired value and said carbon potential signal calculated by said microprocessor.

4,288,063

RUBBER ELASTIC ENGINE MOUNTS OR SUPPORTS WITH HYDRAULIC DAMPING, ESPECIALLY FOR ENGINE SUSPENSIONS IN MOTOR VEHICLES

Heinz Brenner, and Arno Hamaekers, both of Ahrweiler, Fed. Rep. of Germany, assignors to Boge GmbH, Eitorf, Fed. Rep. of Germany

Division of Ser. No. 889,381, Mar. 23, 1978, Pat. No. 4,215,842, which is a continuation-in-part of Ser. No. 791,309, Apr. 27, 1977, Pat. No. 4,161,304. This application May 3, 1979, Ser. No. 35,512
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2718121; Mar. 24, 1977, 2713008
Int. Cl.³ F16F *1/36*
U.S. Cl. 267—8 R **10 Claims**



1. An elastic rubber engine mount with hydraulic damping, especially for engine suspensions in motor vehicles, comprising a first metallic end wall for connection to an engine casing, a second metallic end wall spaced axially from said first wall, a metallic supporting element for connection to an engine supporting frame, a first elastic rubber-like peripheral wall adheringly connected with said first end wall and with said supporting element, an elastic rubber-like partition connected with

said supporting element so as to define with said first end wall and said first peripheral wall a liquid-filled main chamber of variable volume on one side of said partition, a second elastic rubber-like peripheral wall adheringly connected with said second end wall and with said supporting element so as to define an auxiliary liquid-filled chamber of variable volume on the other side of said partition, means forming a choke opening in said partition as a flow connection between said main and auxiliary chambers, and means rigidly connecting said first and second end walls together for joint movement relative to said supporting element, at least one of said metallic end walls being formed with at least one end wall opening covered by a resilient wall part which can flex resiliently to compensate for changes in the volume of said chamber, and thus pose a decreasing resistance to a change of liquid pressure in its appurtenant chamber, said end wall opening having a peripheral edge, the flexible wall part being so arranged that its outward flexure in response to pressure increases in said chamber is limited by engagement between the peripheral edge of said end wall opening and said flexible wall part.

4,288,064

TIMED-ACTION ACTUATORS

Alfred R. Austen, R.D. #1, Box 451, Center Valley, Pa. 18034

Filed May 5, 1980, Ser. No. 146,745
Int. Cl.³ F16F *1/26*
U.S. Cl. 267—182 **15 Claims**

1. A resettable apparatus for producing time delayed force and/or displacement response comprising in combination:

a first or restraining element, said first element being constructed of a material that will, under load, exhibit creep deformation within its intended operating temperature range; and

a second or force producing element disposed proximate said first element so that said second element can be moved into contact with said first element to engage said first element and produce elastic distortion of said first element;

whereby when said second element is moved into an actuation position the elastically distorted portion of said first element creeps such as to increase the distortion under load to, after a time delay, release or permit said second element to return to its original or released position.

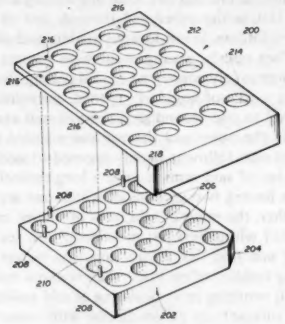
4,288,065

EXTENDER AND HEADER CARD FOR MEDICINAL DISPENSING DEVICE AND FIXTURE BASE CONVERTER FOR FILLING THE SAME

Milton Braverman, 640 Wynmill Pl., Philadelphia, Pa. 19115

Division of Ser. No. 33,923, Apr. 27, 1979, Pat. No. 4,211,329.
This application Jan. 14, 1980, Ser. No. 111,614
Int. Cl.³ B25B *1/20*
U.S. Cl. 269—43 **1 Claim**

1. In combination a fixture base having a plurality of openings extending therein, said openings being disposed in an array of a first predetermined number of rows and columns and a removable converter comprising a planar support surface disposed directly on said fixture base, said base being of a first predetermined thickness and including a plurality of spring loaded alignment pins projecting upward therefrom, said planar support surface having a plurality of alignment apertures in which respective ones of said alignment pins are located, said planar support surface having a first plurality of openings in an array of said first predetermined number of rows and columns and a second plurality of openings disposed in an array of a single row, said first plurality of openings in said converter being aligned with said plurality of openings in said base when said converter is on said base and said alignment pins are located in said alignment apertures, said converter including a ledge projecting downward from said planar support surface a



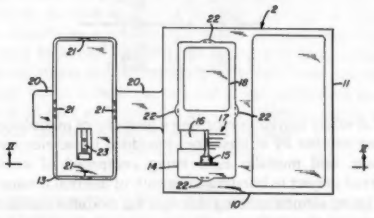
distance equal to said first predetermined thickness, whereupon said ledge contacts the surface upon which said fixture base is disposed.

4,288,066

CONTAINER FOR MEDICAL DEVICE

Harry T. Treace, Forest Hill, Tenn., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.

Filed Dec. 10, 1979, Ser. No. 101,773
Int. Cl.³ B25B *1/24*
U.S. Cl. 269—270 **5 Claims**



1. A container and surgical aid for the storage, transportation, asepsis and surgical preparation of a medical device, comprising:

a base comprising a raised platform adapted for preparing tissue utilized in implantation of said medical device, said base having a first recessed area adapted by size and shape to receive and conform to a substantial portion of said medical device, and a second recessed area coplanar and contiguous with said first recessed area, said second area being adapted to permit the trimming of the said medical device; and

measuring means integrally disposed on the upper surface of said base longitudinally adjacent to the said first recessed area and laterally aligned in the same plane opposite to the said second recessed area;

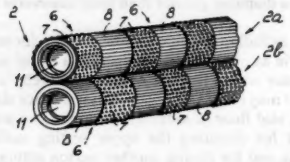
whereby the medical device resting in the first recessed area can be cut to a selected measurement, the said second recessed area permitting a cutting instrument to cut through the medical device as it remains in place.

4,288,067

MACHINE FOR FOLDING SHEETS

Vittorio Vigano', Via Delle Ginestre, 13, Zingonia, Province of Bergamo, Italy

Filed Dec. 26, 1978, Ser. No. 973,297
Claims priority, application Italy, Jan. 4, 1978, 19019 A/78
Int. Cl.[3] B65H *45/18*
U.S. Cl. 493—420 4 Claims



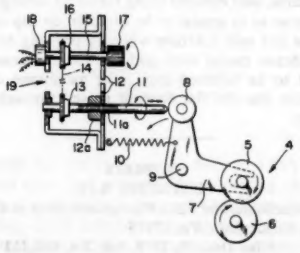
1. A machine for folding sheet material, comprising a stationary frame, at least one pair of rollers rotatably supported by said stationary frame and arranged parallel to each other, pressure members for biasing said rollers toward each other, a plurality of sleeves on said each rollers each having a coated portion of substantially hard and unelastic rubber-like material; each of said coated portions having a circumferential surface having a plurality of flexible bosses thereon, said coated portions being arranged axially spaced from one another on said rollers to define uncoated portions therebetween, wherein said coated portions and said uncoated portions have equal axial lengths and said flexible bosses have outer ends projecting radially above said uncoated portions, and wherein said coated portions of one of said rollers are axially offset with respect to said coated portions of the other of said rollers such that each of said coated portions on one of said rollers exactly faces a corresponding one of said uncoated portions on the other of said rollers.

4,288,068

SHEET FEEDING DEVICE

Hideo Hashimoto, Yokohama, and Tokuzo Kaneda, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Japan

Filed May 2, 1980, Ser. No. 146,089
Claims priority, application Japan, May 14, 1979, 54-62938[U]
Int. Cl.[3] B65H *3/52*
U.S. Cl. 271—125 7 Claims



1. A sheet feeding device comprising:

a sheet feeding member maintained in contact with the uppermost sheet of a stack of sheets for feeding one sheet after another in a sheet feeding direction;

sheet separating means including a pair of separating members comprising a feeding member for exerting a sheet conveying force on a sheet, and a braking separating member exerting a sheet arresting force on a sheet to stop the movement thereof or forcing same to move oppositely to the sheet feeding direction, said separating members being located downstream of said sheet feeding member with respect to the sheet feeding direction;

a speed adjusting mechanism including an adjusting member for suitably adjusting the sheet feeding speed;

a supporting member for journalling at least one of said feeding member and said braking separating member for movement toward or away from the other separating member; and

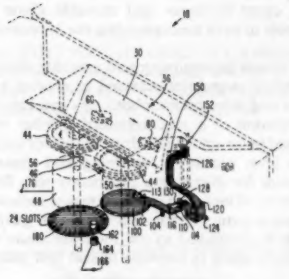
transmission means operative to move said supporting member in synchronism with the movements of said adjusting member of said speed adjusting mechanism to vary the spacing between said feeding member and said braking separating member.

4,288,069

CAM OPERATED DOCUMENT STOP FOR HIGH SPEED ITEM SORTER

Harry L. Wallace, Livonia, and John D. Thomas, [illegible]h, both of Mich., assignors to Burroughs Corporation, D[illegible]roit, Mich.

Filed Nov. 29, 1979, Ser. No. 87,228
Int. Cl.[3] B65H *9/06*
U.S. Cl. 271—245 3 Claims



3. A mechanism having a stop mode and a go mode for controlling the flow of documents through a hold and view station of a high speed sorting system, comprising:

a stop arm pivoted to rock between a go position allowing documents to pass and a stop position preventing documents from passing;

an actuator arm linked to said stop arm and pivoted to rotate about an axis between a first position urging said stop arm to its go position and a second position urging said stop arm to its stop position;

a cam linked to said actuator arm and pivoted to rotate about an axis and drive said actuator arm between its first and second positions;

drive means including a motor linked to said cam by a drive shaft to rotate said cam;

sensing means coupled to the drive shaft of the motor to provide a plurality of timing pulses, and

processing means responsive to said timing pulses to turn the motor off at a particular pulse count for a selected period to permit documents to leave the hold and view station;

said processing means turning the motor on after said selected period to enable the stop arm to return to the stop position.

4,288,070

CHUTE RETURN MECHANISM FOR A PHOTOCOPIER COLLATOR

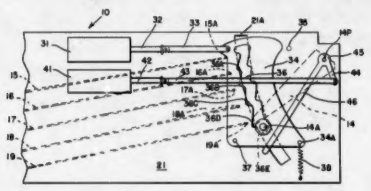
Fred R. Langner, 48 Hillcrest La., Williamsport, Pa. 17701

Continuation-in-part of Ser. No. 46,673, Jun. 8, 1979. This application Sep. 12, 1979, Ser. No. 75,135

The portion of the term of this patent subsequent to May 8, 1998, has been disclaimed.

Int. Cl.[3] B65H *29/60, 39/11*

U.S. Cl. 271—296 10 Claims



1. A chute return mechanism for a collator adapted for use with an electrostatic photocopy machine, said collator including a plurality of bins mounted within a housing, a movable chute operatively positioned to receive photocopies from a discharge slot of said electrostatic photocopy machine and divert said photocopies to each of said plurality of bins, said movable chute being selectively pivoted from an initial position, indexing means for selectively pivoting said movable chute including an electrical connection adapted to receive a first pulse from said electrostatic photocopy machine indicating that a photocopy has been discharged therefrom, said pulse actuating said indexing means for selectively pivoting said movable chute to lower said movable chute for diverting photocopies to each successive bin, the improvement comprising:

return means for returning said movable chute including an electrical connection adapted to receive a second pulse from said electrostatic photocopy machine indicating the completion of a predetermined number of copies, said second pulse actuating a drive means for imparting motion to a lever means for returning said chute to its initial position for diverting a photocopy to a first bin of said plurality of bins, said indexing means includes a cam latch having a tortuous path with flanges for guiding a follower element connected to the movable chute to lower said movable chute in response to said first pulse.

4,288,071

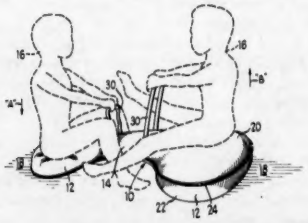
PNEUMATIC SEESAW APPARATUS

David A. Glickson, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 21, 1979, Ser. No. 106,281

Int. Cl.[3] A63G *31/00*

U.S. Cl. 272—1 R 10 Claims



1. Pneumatic seesaw apparatus, comprising: an elongated, hollow, unitary, air-tight, flexible vessel formed of two thin flexible sheets of material of substantially uniform thickness, said sheets joined along their edges and said vessel inflatable to contain a volume of gas under pressure and collapsible to flattened configuration when uninflated;

said vessel including a pair of relatively large volume, generally circular-shaped, hollow seats, at opposite ends and interconnected by an integrally formed, centrally disposed hollow tubular conduit portion having an internal volume substantially less than said circular-shaped seats and a transverse dimension substantially less than the diameter of said seats at the end, said circular-shaped seats having a diameter greater than their transverse dimension; and

each seat including an upper seating surface for supporting a person in an elevated position above a lower wall portion in contact with a floor or support, whereby a person on one seat may force said upper seating surface downwardly toward said floor to move air from said one seat into said conduit for elevating the upper seating surface of the opposite seat for raising another person sitting thereon.

4,288,072

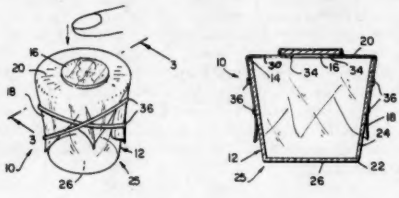
ILLUSION CREATING DEVICE

William Gewirtz, 2500 Johnson Ave., Bronx, N.Y. 10463

Filed Sep. 21, 1979, Ser. No. 77,724

Int. Cl.[3] A63J *21/00*

U.S. Cl. 272—8 N 9 Claims



1. An illusion creating device comprising:

a. a support structure having a support edge encircling an aperture;

b. a rigid flat element smaller in diameter than the diameter of said aperture; and

c. an elastic membrane means being supported on said support edge and being stretched over said flat element to a degree wherein a supporting segment of said membrane underlies at least a portion of said element and supports the same, said element being viewable through said membrane so as to appear to be disposed on top of said membrane and said aperture whereby pressing said stretched membrane means over said flat element causes said element to be released from said membrane creating the illusion that the flat element passed through said membrane.

4,288,073

EXERCISE BAR

Frank Petrachonis, and Felix Petrachonis, both of 411 W. Chester St., Shenandoah, Pa. 17976

Filed Dec. 19, 1979, Ser. No. 105,212

Int. Cl.[3] A63B *13/00*

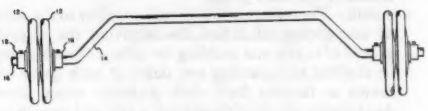
U.S. Cl. 272—123 2 Claims

1. An exercise bar for use by weight lifters in performing wide grip bench presses, said bar comprising:

a straight horizontally elongated relatively long central section of unifrom diameter, the length of said central section falling within the approximate range 30 to 39 inches;

two like straight downwardly and outwardly extending short inclined sections, the diameter of the inclined sections being equal to that of the central section, said in-

clined and central sections lying in a common plane, the uper end of each inclined section being integral with and directly adjacent to a corresponding end of the central section, each inclined section intersecting the central section with a like included angle, the included angle falling within the approximate range 151 to 160 degrees, each inclined section being adapted to be grasped by a corresponding one of the hands of the lifter when the bar is in use, the length of each inclined section falling within the approximate range 4 to 5 inches; and



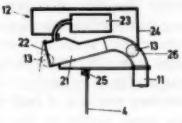
two like straight horizontally elongated end sections of intermediate length falling along a corresponding horizontal line and lying in said common plane, one end of each end section being integral with and directly adjacent to the lower end of the corresponding inclined section, said end sections extending outwardly from the inclined sections, the diameter of the end sections being equal to that of the central section, each end section being adapted to have weights secured thereto when the bar is in use, the length of each section falling within the approximate range 12 to 16 inches.

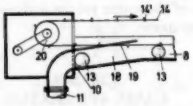
4,288,074

APPARATUS FOR CONVEYING TENNIS BALLS TO A BALL-THROWING MACHINE

Norbert Kainz, Pyrkergasse 21, Vienna, Austria

Filed Jul. 14, 1980, Ser. No. 168,337
Int. Cl.[3] A63B *61/00*
U.S. Cl. 273—29 A **6 Claims**





1. Apparatus for conveying tennis balls to a ball-throwing machine, said apparatus comprising a collecting chute; a rebound-deadening wall projecting upwards from one side of said collecting chute; a flexible tube having first and second ends and attached at said first end to said collecting chute at a withdrawal point thereof; a rigid conduit having first and second ends and attached at said first end thereof to said second end of said flexible tube; a hinged closure at said second end of said rigid conduit; and a device for generating underpressure connected laterally to said rigid conduit, whereby said underpressure in said rigid conduit normally holds said hinged closure in a closed position and tennis balls passing from said collecting chute into said flexible tube are conveyed therealong by said underpressure to said rigid conduit where a ball is capable of opening said hinged closure and thereby passing out of said rigid conduit to said ball-throwing machine; said apparatus being further characterised in that:

(a) said collecting chute is provided with an endless conveyor element passing around two sheaves and provided with spaced ball-entrainment means, a run of said conveyor element being spaced above a bottom of said collecting chute by a distance so as to engage balls in said chute;

(b) said collecting chute has a downwardly sloping section only at one end adjacent to said withdrawal point and is provided above said downwardly sloping section with at least two guide members adapted to deflect said balls downwards, said run of said conveyor element passing between said guide members;

(c) a double section ramp is fitted to the side of said chute remote from said one side from which said rebound-deadening wall projects upwards, a first section of said ramp rising upwards away from said collecting chute and a second section of said ramp descending from said first section in use to the level of a tennis court on which said chute stands; and

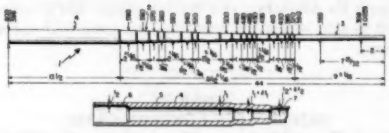
(d) said flexible tube is freely movable and extends to a ball-dispensing unit incorporating said device for generating underpressure and said rigid conduit and adapted to be fitted to said ball-throwing machine, said device for generating underpressure being attached to the upper wall of an obliquely downwardly sloping end piece of said rigid conduit, said end piece being provided at its lower end with said hinged closure and having a cross section greater than an upstream portion of said rigid conduit.

4,288,075

ULTRA LIGHT WEIGHT GOLF CLUB SHAFT

Eugene Kaugars, and George A. Ossola, both of Torrington, Conn., assignors to Brunswick Corporation, Skokie, Ill.

Filed Aug. 27, 1979, Ser. No. 69,796
Int. Cl.[3] A63B *53/12*
U.S. Cl. 273—80 B **6 Claims**



1. A light weight, hollow metal, golf club shaft tapered with a step pattern, having approximately the same deflection feel as conventional weight golf club shafts having the same stiffness characteristics, having a grip section including a grip portion at one end and weighing not more than about 2.9 ounces.

said shaft exclusive of the grip portion having a thin, substantially uniform, wall thickness,

said shaft consisting of a metal having a yield strength after heat treatment of at least about 235000 lbs./in^2 and an ultimate strength of at least 265000 lbs./in.^{2},

said shaft being subject to a maximum bending moment in the grip section during play,

the said grip section comprising a portion having a wall thickness greater than the wall thickness of the rest of the shaft in order to resist said bending moment,

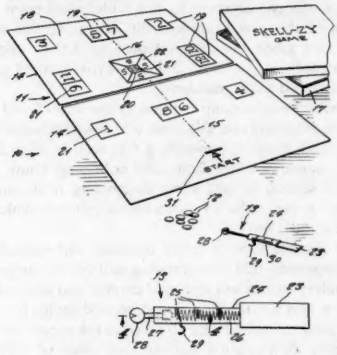
said portion of greater wall thickness comprising at least a part of the grip section, and wherein the entire grip section has the same outside diameter.

4,288,076

FOLDABLE GAMEBOARD AND DISC PLAYING PIECE APPARATUS

Ralph Oyague, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Jan. 15, 1979, Ser. No. 3,639
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—126 R **3 Claims**



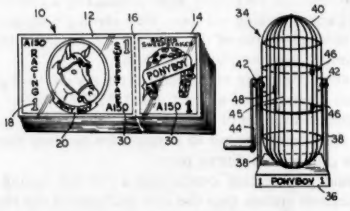
1. A game, comprising in combination, gameboard, a set of playing pieces for movement upon said gameboard, and a plurality of shooters for hitting said playing pieces to propel them over the gameboard said gameboard comprising a pair of foldable panels which together upon one side thereof include a printed playing field of numbered playing spaces around a central playing space, and a starting line at one end of said playing field, said playing pieces each being individually differently colored and including air lift means for causing each piece to lift upon being propelled by said shooter, each said shooter comprising a calibrated, transparent barrel having a hand grip attached to one end thereof, a compression coil spring inside said barrel and having one of its ends attached to one end of a stem, said stem projecting from the opposite end of said barrel, and a hitting plate attached to the other end of said stem for contacting said playing pieces, and a puller attached to said spring for retracting the same into operative position.

4,288,077

HORSE RACE LOTTERY GAME

William A. Rose, 1225 Eastland Dr., Lexington, Ky. 40505, and Scott D. Rose, 4510 N. Sherman Dr., Indianapolis, Ind. 46226

Filed Apr. 8, 1980, Ser. No. 138,523
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—246 **18 Claims**



1. A horse race lottery game for a plurality of players comprising in combination:

a racetrack having a plurality of laterally spaced starting positions and a finish line,

a plurality of game pieces adapted to be supported on the racetrack and movable therearound, there being less game pieces than number of players,

a plurality of groups of tickets selectable by the players and corresponding respectively to said game pieces wherein each said group comprises a plurality of tickets having first indicia thereon corresponding to only one of the game pieces, and have second indicia means thereon to enable each ticket to be distinguished from the other tickets of the same group,

a plurality of container means equal in number to the number of said groups of tickets for receiving the respective groups of tickets and enabling the tickets of each group to be shuffled and enabling one ticket of each group to be drawn at random from each container means thereby determining which of the players is assigned to each game piece during a subsequently run race of the game pieces,

means for determining the starting position of each of said game pieces, and

means for enabling the game pieces to move out of their starting positions and around the racetrack until all of the game pieces cross the finish line thereby determining the finishing placings of the game pieces assigned to the respective players selected by the container draw.

12. A method for playing a horse race lottery game comprising:

providing a racetrack having a plurality of starting positions and a finish line,

providing a plurality of game pieces, there being less game pieces than players playing the game,

providing a plurality of groups of tickets corresponding respectively to the game pieces wherein each group comprises a plurality of tickets having indicia corresponding to only one of the game pieces and having indicia enabling each ticket to be distinguished from the other tickets of the same group,

each player selecting one or more tickets of his choice and placing the selected tickets of each group in a separate container such that the selected tickets are stored in containers pertaining to the respective game pieces,

shuffling the tickets in their respective containers,

drawing at random a single ticket from each container thereby assigning a player to each of the game pieces,

determining the starting position of each of the game pieces and moving the game pieces to the respective starting positions on the racetrack, and

causing the game pieces to move out of their starting positions and around the racetrack until all of the game pieces have crossed the finish line thereby determining the finishing placings of the game pieces assigned to the winners of the container draw.

4,288,078

GAME APPARATUS

Julio I. Lugo, B. Boca - Buzon B106, Guayanilla, P.R. 00656

Filed Nov. 20, 1979, Ser. No. 96,207
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—264 **1 Claim**

1. A game for two players having playing rules and a scoring system, and comprising a board having a field consisting of

a. a first regular octagonal figure,

b. a second regular octagonal figure concentric with and within the first octagonal figure, with its sides parallel respectively to the sides of the first octagonal figure,

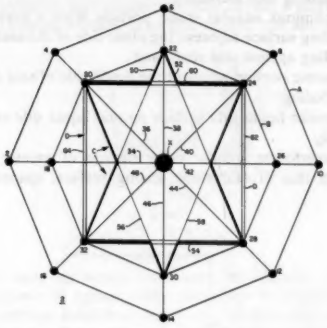
c. radial lines extending through each aligned pair of corners of the two octagonal figures, all of said lines meeting at the common center of the two figures,

d. each corner point of the two octagonal figures and the center point of intersection of the radial lines being distinctively marked,

e. a six-pointed star within the inner octagonal figure, such

star being formed by two oppositely extending isosceles triangular figures the apices and the ends of the bases of which are at opposite corner points of the inner octagonal figure,

f. a square within the inner octagonal figure, two sides of which are formed by the bases of the two triangles of the six-pointed star and the other two sides of which join the end points of said bases,



g. a first set of five counters to be used by one player, and a second set of five counters visually differentiated from the first set to be used by another player,

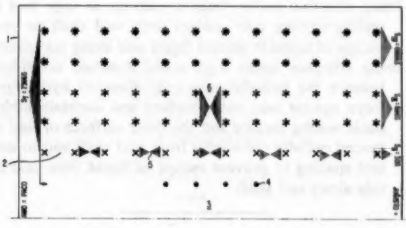
h. the ends of the base of each of the triangular figures, the two corner points of the first octagonal figure which are aligned with said ends, and the corner point of the first octagonal figure between said two corner points providing initial positions for each set of counters from which the counters are moved in either direction along the radial lines of the field.

4,288,079

GAME APPARATUS

Jean-Claude M. J. Belony, 2803 Keith St., Marlow Heights, Md. 20031

Filed Aug. 16, 1979, Ser. No. 67,192
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—273 **19 Claims**



1. A game apparatus comprising:

(a) at least ten distinct playing pieces each bearing means to indicate distinctness;

(b) a game board including at least one planar playing section, said at least one playing section including a first subsection having a first plurality of one-variable playing piece receiving means for receiving one playing piece, a second subsection having a second plurality of spaced apart two-variable playing piece receiving means for receiving two playing pieces, a third subsection having a third plurality of spaced apart three-variable playing piece receiving means for receiving three playing pieces, and a fourth subsection having a fourth plurality of spaced apart four-variable playing piece receiving means for receiving four playing pieces; and

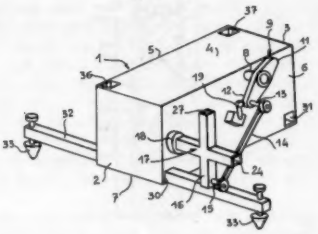
(c) chance means for determining which of said pieces may be played and in which of said subsections said pieces may be played.

4,288,080

APPARATUS FOR TARGET PRACTICE

Jean C. Laporte, and Jean M. Laporte, both of Biot, France, assignors to S.A.R.L. Laporte Cibelec, Antibes, France

Filed Dec. 19, 1979, Ser. No. 105,241
Int. Cl.³ F41J *7/00*
U.S. Cl. 273—406 **3 Claims**



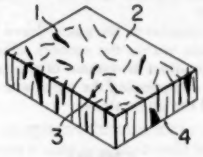
1. Apparatus for target practice, comprising a body enclosing a motor that drives a shaft that supports a target, means for mounting the body on a support selectively in either of two positions spaced apart from each other by 90°, said shaft extending from the body horizontally in one said position and vertically in the other said position, said shaft having a perpendicular cross arm, and means selectively to mount the target either on said shaft or on said cross arm.

4,288,081

GASKETS FOR ELECTRIC SHIELDING

Ryoichi Sado, Saitama, Japan, assignor to Shin-Etsu Polymer Company, Ltd., Tokyo, Japan

Filed Apr. 18, 1980, Ser. No. 141,482
Claims priority, application Japan, Apr. 28, 1979, 54-52915
Int. Cl.³ H05K *9/00*; H01B *1/06*; F16J *15/14*
U.S. Cl. 277—1 **2 Claims**



2. A method for the preparation of a gasket for electric shielding which comprises the steps of

(a) admixing flakes of an electrically conductive material into an electrically insulating rubbery elastic material in a plastic condition to form a composite dispersion of the flakes in the rubbery elastic material as the matrix,

(b) subjecting the thus obtained composite dispersion to shearing deformation on one direction so as that the flakes are oriented in the matrix to have the flat surfaces thereof substantially in parallel with the direction of the deformation,

(c) hardening the rubbery elastic material in a plastic condition to fix the flakes as dispersed and oriented in the matrix, and

(d) slicing the composite dispersion with the thus hardened

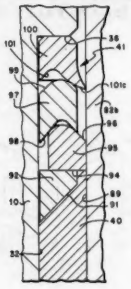
rubbery elastic material in a plane substantially not in parallel with the direction of the deformation.

4,288,082

WELL SEALING SYSTEM

John R. Setterberg, Jr., Richardson, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 30, 1980, Ser. No. 145,328
Int. Cl.³ F16J *15/28*
U.S. Cl. 277—125 **17 Claims**



1. A well sealing system for blocking fluid flow through an annulus partially defined by the exterior of a first tubular means and the interior of a second tubular means when the first tubular means is disposed within the second tubular means, comprising:

a. a production well packer attached near one end of the first tubular means and engageable with the interior of the second tubular means;

b. a plurality of packing rings carried on the exterior of the first tubular means and engageable with the interior of the second tubular means;

c. a metal seal ring carried on the exterior of the first tubular means;

d. means for compressing and radially expanding the metal seal ring to contact the interior of the second tubular means when the first tubular means is disposed therein;

e. the means for compressing and radially expanding the metal seal ring comprising a guide sleeve slidably carried over the other end of the first tubular means;

f. a shoulder on the exterior of the first tubular means and the metal seal ring disposed between the guide sleeve and the shoulder; and

g. the outside diameter of the guide sleeve sized to engage a first restriction within the second tubular member preventing longitudinal movement of the guide sleeve therethrough and compressing the metal seal ring between the shoulder and the guide sleeve.

4,288,083

HYDRODYNAMIC SHAFT SEAL

Karl Braconier, Bridgewater, N.H., assignor to International Packings Corporation, Bristol, N.H.

Filed Feb. 7, 1980, Ser. No. 119,297
Int. Cl.³ F16J *15/32, 15/40*
U.S. Cl. 277—134 **4 Claims**

1. A shaft seal for use between a rotating shaft and a surrounding stationary housing under both static and dynamic conditions, said housing having an opening extending therethrough and receiving said shaft therein

said shaft seal comprising

an annular resilient seal body adapted to be fixed relatively to said housing in a position encircling said shaft

said resilient seal body having a central axis coincident with that of said shaft and comprising

an integral radially inwardly extending flexible inner portion terminating in a generally annular sealing face for sliding engagement with the periphery of said shaft, the liquid axial side of said seal body being exposed to a liquid to be sealed against leakage, and

an outer annular spring-retaining groove located radially outwardly of said sealing face, and

an annular coil spring mounted in said groove providing a radially inwardly directed force biasing said sealing face radially inwardly toward said shaft

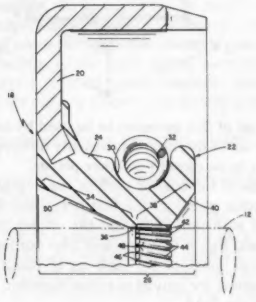
said sealing face including

a continuous annular static portion with a narrow static sealing surface adjacent the other side of the seal for static sealing against said shaft, and

a dynamic portion adjacent the liquid side of said seal body, including

an annular liquid side surface on said liquid side of said seal body

an imperforate annular outer surface of greater diameter than that of said static sealing surface, spaced radially



outwardly from said shaft and extending axially from said static sealing surface toward said liquid side of said seal body and intersecting said liquid side surface, said outer surface having a plurality of peripherally spaced vanes extending radially inwardly and extending axially at an angle to the axis of said seal body,

said outer surface and said vanes forming chambers therebetween open to said liquid side of said seal body,

said spring force

being effective under static conditions to urge said static sealing surface into contact with said shaft to prevent escape of liquid from said liquid side along said shaft, and

being effective under high speed dynamic conditions to balance the radially outwardly directed hydrodynamic force against said outer surface and maintain both said static sealing surface and the inner surfaces of said vanes spaced radially outwardly from said shaft and to control said spacing to prevent escape of liquid from said liquid side along said shaft.

4,288,084

CHUCK COLLAR

Robert H. Newberry, 4502 Havre Way, Pensacola, Fla. 32505

Filed Oct. 5, 1979, Ser. No. 82,285
Int. Cl.³ B23B *31/06*
U.S. Cl. 279—60 **18 Claims**

8. A chuck assembly including:

(a) an outer cylinder with a set of teeth circumferentially arranged around one end thereof;

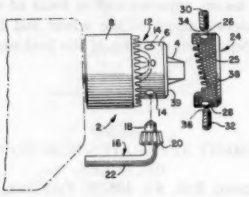
(b) an inner cylinder rotatably mounted within said outer cylinder, said inner cylinder having at least one chuck key pivot hole formed therein adjacent the set of teeth on said outer cylinder;

(c) a jaw mechanism mounted within said inner cylinder and

movable between fully open and fully closed positions upon relative rotation of said inner and outer cylinders;

(d) a chuck key means for providing torque to rotate said inner cylinder relative to said outer cylinder, said chuck key means including a pivot pin and a bevel gear which may be brought into registry with said set of teeth on said outer cylinder by inserting said pivot pin into one of said chuck key pivot holes; and

(e) an annular member shaped to releasably fit over said inner cylinder, said annular member having a plurality of teeth circumferentially arranged around one and thereof



and a securing means for fixing said annular member simultaneously against either clockwise or counterclockwise rotation relative to said inner cylinder and for spacing said annular member from said outer cylinder in a position such that a bladed instrument may be used to simultaneously engage the teeth in said plurality of teeth on said annular member and the teeth in said set of teeth on said outer cylinder to provide a torque for rotating both said inner cylinder and said annular member relative to said outer cylinder when the bladed instrument is turned.

4,288,085

FORCE ACTUATED JAW CHUCK

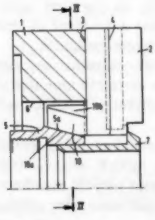
Herbert Antoni, Grevenbroich, Fed. Rep. of Germany, assignor to Paul Forkardt Kommanditgesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 116,359

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2903904

Int. Cl.³ B23B *31/16*

U.S. Cl. 279—121 **6 Claims**



1. In a powered-operated jaw chuck, formed as a hollow chuck, with clamping jaws radially displaceably guided in a chuck body and adapted for external and internal clamping, each of the clamping jaws being actuatable, via a common chuck piston movable axially through a bore in the chuck body, by means of a separate wedge hook transmission, respectively, each said wedge hook transmission comprising wedge surfaces inclined in an axial direction and formed in a circumferential direction in pairs on the chuck piston and on a wedge hook, each said wedge hook being formed T-shaped in cross section with a web and has a radially innermost base surface which forms a continuous wedge surface adapted for the internal clamping cooperating with a wedge surface of the chuck piston, said wedge hook has other wedge surfaces laterally adjacent to the web respectively, said chuck piston is formed with ledge-shaped wedge pieces, said wedge pieces extend in the circumferential direction of said chuck piston substantially up to said web of the wedge hook, said wedge pieces cooperate respectively with said other wedge surfaces respectively of said wedge hook for the external clamping, the improvement wherein

said chuck body has an uninterrupted cylindrical guide surface defining said bore of the chuck body as a completely closed bore, said chuck piston is disposed in said bore,

each of said wedge pieces has a partial cylindrical outer surface, said partial cylindrical outer surface of each said wedge pieces is operatively supported in the bore of the chuck body against said cylindrical guide surface,

the clamping jaws each have a radially inwardly facing radially innermost free surface and a radially extending axially facing rear side, said rear side has a radially-inner end, said web constitutes means for connecting said wedge hooks, respectively, to said rear side at said radially-inner end of said rear side, with said wedge hooks formed on and arranged at the rear side at said radially-inner end of the rear side of a corresponding of said clamping jaws, respectively, spaced from said radially inwardly facing radially innermost free surface of said clamping jaw,

each said wedge hooks formed on said clamping jaws respectively has a radial thickness between said wedge surfaces thereof greater than the radial thickness of said ledge-shaped wedge pieces respectively of said chuck piston.

4,288,086

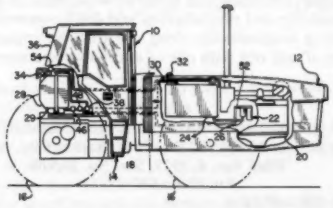
FUEL TANK ARRANGEMENT FOR A TRACTOR

Harold C. Oban, Darien, and Charles M. Peterson, Downers Grove, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 22, 1980, Ser. No. 114,435

Int. Cl.³ B60K *15/06*

U.S. Cl. 280—5 A **7 Claims**



1. A fuel tank arrangement for a tractor having fuel stored in an auxiliary tank and a main tank, said tanks being spaced apart in said tractor with said fuel supplied to the engine of said tractor through a primary fuel filter by a fuel pump, said arrangement comprising, in combination:

a first line fluidly connecting said main tank to said fuel pump;

a main vent fluidly connecting the forwardmost portion of the upper section of said main tank to the atmosphere;

an auxiliary vent fluidly connecting the rearwardmost portion of the upper section of said auxiliary tank to the atmosphere;

a supply system whereby all of the fuel passes through said main tank to said fuel pump, said system including

a second line fluidly connecting the bottom section of said auxiliary tank to said forwardmost portion of said top section of said main tank;

first means fluidly interposed in said second line for providing fuel flow from said auxiliary tank to said main tank

until said fuel in said main tank reaches a first predetermined volume;

second means fluidly interposed in said second line between said first means and said auxiliary tank for removing foreign matter from said fuel before it passes through said first means; and

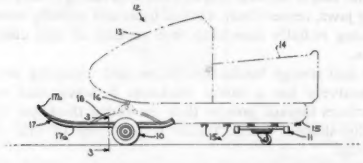
third means fluidly connected to said second line between said first means and said main tank, and fluidly connected to said rearwardmost portion of said upper section of said auxiliary tank, for venting said second line to said atmosphere when a vacuum occurs in said second line, and for maintaining the exclusivity of said fuel flow from said first means to said main tank.

4,288,087

SIMPLIFIED SNOWMOBILE SUPPORT DOLLY

Robert I. Morrison, Delavan, Wis., assignor to MPD Enterprises of Delavan, Inc., Delavan, Wis.

Filed Jul. 25, 1979, Ser. No. 60,485
Int. Cl.³ B62B *1/10*
U.S. Cl. 280—47.32 **1 Claim**



1. A single-wheeled dolly adapted to support a snowmobile having a longitudinally extending, endless drive track including a plurality of transverse traction ribs, said dolly comprising:

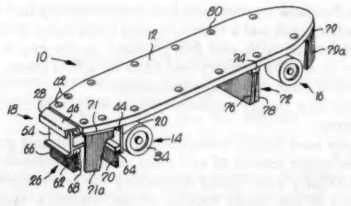
a pair of spaced apart transverse supports having a length generally similar to the width of said track; at least one elongated member interconnecting said transverse supports; and only one wheel, said wheel comprising a caster wheel pivotally mounted to said elongated member intermediate said transverse members, said dolly adapted to support said track with said transverse supports extending parallel to said ribs, whereby said dolly is prevented from sliding longitudinally along said track by engagement of one of said ribs with one of said transverse supports.

4,288,088

BRAKE ASSEMBLY FOR SKATEBOARD

William H. Harrison, P.O. Box 8863, Kansas City, Mo. 64109

Filed Apr. 6, 1979, Ser. No. 27,872
Int. Cl.³ A63C *17/14*
U.S. Cl. 280—87.04 A **5 Claims**



1. A brake assembly for a skateboard having a rider-supporting board and spaced front and rear wheel assemblies secured to said board, said brake assembly comprising:

a brake plate;

means shiftably supporting said plate adjacent one of said wheel assemblies for movement of the plate between a braking position wherein the plate is in frictional engagement with a wheel of said one assembly, and a non-braking position wherein the plate is out of engagement with said wheel;

means for biasing said plate to the non-braking position thereof;

operating means including a pedal disposed for depression by a rider standing on said board and means operatively coupling said pedal and plate for movement of the plate to the braking position thereof when said pedal is depressed; and

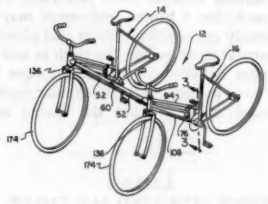
at least one ground-engaging brush element secured to said coupling means adjacent and in front of said wheel for clearing debris ahead of the wheel and for, when said pedal is depressed, assisting in the braking of said skateboard.

4,288,089

ATTACHMENT APPARATUS FOR SIDE-BY-SIDE BICYCLES

Henry F. Thiessen, R.R. #1, 405 W. Port Ave., Buhler, Kans. 67522

Filed Jul. 30, 1979, Ser. No. 61,766
Int. Cl.³ B62K *13/06*
U.S. Cl. 280—209 **9 Claims**



3. An attachment apparatus for interconnecting side-by-side bicycle members, comprising:

(a) a main support coupling means to interconnect said bicycle members, including a horizontal connector assembly and an inclined connector assembly connected between said horizontal connector assembly and respective ones of said bicycle members;

(b) a steering coordinator means connected between a steering mechanism on each of said bicycle members to achieve conjoint movement of front wheel members on each of said bicycle members;

(c) said horizontal connector assembly includes a steering post connector assembly mounted on each of said bicycle members and interconnected to each other by a connector rod assembly;

(d) said connector rod assembly includes an outer connector tube member which allows independence rotational movement of said bicycle members;

(e) said steering post connector assembly includes a connector member mounted against each respective steering housing of each of said bicycle members by clamp members;

(f) each of said connector members having a laterally extended horizontal tube portion for connection to said connector rod assembly;

(g) said connector rod assembly includes said outer connector tube member secured at outer ends to respective ones of said horizontal tube portions and an inner main rod assembly connected to said outer connector tube member to maintain the spaced relationship of said bicycle members; and

(h) said outer connector tube member constructed in half sections to permit relative rotational movement therebetween.

4,288,090

ELASTIC LATERAL SUPPORT WITH SUPPORTING WHEEL FOR CHILDREN'S BICYCLES

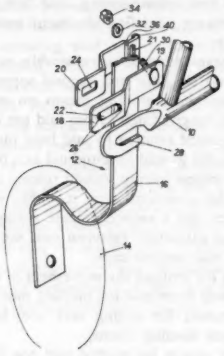
Franz Müller, Eichelhäherstrasse 1, 6200 Wiesbaden, and Helmut Müller, Brunnenstrasse 63, 6231 Liederbach, both of Fed. Rep. of Germany

Filed Nov. 15, 1979, Ser. No. 94,678

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1978, 2850568

Int. Cl.³ B62H *1/12, 7/00*

U.S. Cl. 280—293 **12 Claims**



1. An elastic lateral support with supporting wheel for children's bicycles comprising a single resilient part releasably attachable at one end to the frame of the bicycle and having said supporting wheel at the other end, said lateral support in the mounted state at a tilting moment of 15 Nm exhibiting an elastic deflection of at least 20 mm and being deflectable up to the contact of the resilient part or of the supporting wheel on the frame.

4,288,091

APPARATUS FOR COUPLING A TRACTOR, A DUMP TRAILER AND A DUMP TRUCK

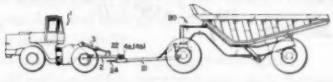
Haruhiko Umeda, Yokohama; Hidehiro Takeuchi, Kawasaki; Masaru Uenoyama, Ayase; Kotoshige Ishizuki, Yokohama; Hiroyuki Ando, Kawasaki, and Hideo Hara, Tokyo, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 13, 1978, Ser. No. 951,271

Claims priority, application Japan, Oct. 13, 1977, 52-136263[U]

Int. Cl.³ B60D *1/04*

U.S. Cl. 280—415 A **1 Claim**



1. An apparatus for coupling a tractor, a dump trailer and a dump truck, comprising:

an arm member pivotally connected to said tractor, said arm member being pivotable in the vertical direction;

first coupling means provided at the leading end of said arm member, said first coupling means comprising a pair of grippers arranged opposite to each other, each having a partial-spherical engaging hole formed therein at the opposing surfaces thereof, spring means mounted between said grippers so as to normally urge said pair of grippers away from each other at the leading ends thereof, cotter means engageable with said grippers when said grippers are closed thereby maintaining said grippers in the closed condition, and cylinder means coupled to said cotter means for moving said cotter means to engage and disengage said cotter means and said grippers;

a draw bar pivotally connected to said dump trailer, said draw bar having second coupling means formed thereon, said second coupling means comprising a trunnion having a partial-spherical surface adapted to be engageable with the engaging holes of said grippers to enable said dump trailer to be drawn by said tractor and rotate vertically and horizontally with respect thereto;

third coupling means formed on said draw-bar, said third coupling means comprising at least one hole formed in the leading end portion of said draw bar; and

fourth coupling means pivotally mounted on a rear axle of said dump truck said fourth coupling means being adapted to engage with said third coupling means to enable said dump trailer to be drawn by said dump truck after disconnecting said dump trailer from said tractor wherein said fourth coupling means comprises a coupler mounted on the rear axle of said dump truck so as to pivot in the vertical direction, said coupler having a hole formed therein at the trailing end portion thereof, a pair of damper means for supporting said coupler approximately in horizontal position, and fluid cylinder means mounted on said coupler means, said fluid cylinder means having a coupler pin connected with a piston rod thereof, said coupler pin being adapted to be inserted into said at least one hole of said third coupling means and said coupler so as to connect said dump trailer with said dump truck.

4,288,092

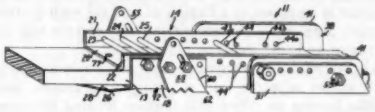
SKI ACCESSORY

Louis E. Mukri, 13000 Roselle Ave., Hawthorne, Calif. 90250

Filed Jan. 22, 1979, Ser. No. 5,151

Int. Cl.³ A63C *5/00*

U.S. Cl. 280—605 **5 Claims**



1. An accessory device for a ski having a forward leading end comprising:

a channel member having a web portion to extend under said ski and upwardly extending side portions to straddle the sides of said ski,

a chassis member to extend over said ski,

means for attaching said side portions of said channel member to said chassis member, and

a resilient deflector plate secured at the rear thereof to the bottom of said web portion and extending upwardly and forwardly to engage the forward end thereof against the bottom of said ski and to yieldably hold said chassis member against the top of said ski,

said accessory device also comprising:

a traction member,

means pivotally supporting said traction member on said chassis member for trailing movement over the snow during forward movement of said ski and for downward swinging movement to penetrate the snow upon rearward movement of said ski, and

means for limiting said downward movement of said traction member,

said traction member comprising a channel element having a web section to extend under said ski and side sections to straddle said sides of said ski,

said deflector plate and said web section supporting the

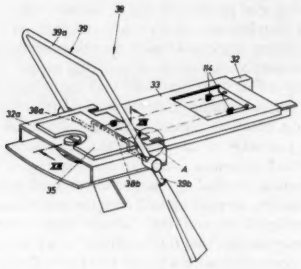
intermediate bottom portion of said ski above the surface of the snow during forward movement of said ski.

4,288,093

SOLE-SUPPORT MECHANISM FOR THE SOLE OF A SKI BOOT

Erwin Krob, Vienna, and Josef Svoboda, Schwechat, both of Austria, assignors to TMC Corporation, Switzerland

Filed Jul. 6, 1979, Ser. No. 55,337
Claims priority, application Austria, Jul. 7, 1978, 4928/78
Int. Cl.³ A63C *11/00*
U.S. Cl. 280—605 **6 Claims**



1. A sole support mechanism for the sole of a ski boot secured to a ski between a toe jaw and a heel holder, comprising:

guide rail means adapted to be mounted on said ski;

guide plate means mounted for reciprocal movement on said guide rail means, said heel holder being fixedly mounted on said guide plate means for movement therewith, said heel holder including means adapted to engage and hold said sole of said ski boot;

stepping plate means on said guide plate means for supporting the heel portion of the sole of said ski boot during changes in the spacing between said toe jaw and said heel holder in response to a flexing of said ski with no relative longitudinal movement occurring between the sole of said ski boot and said stepping plate means;

a ski brake pivotally secured about a pivot axle to said guide rail means adjacent said stepping plate means, said ski brake having an offset axle portion located between the lateral edges of said ski;

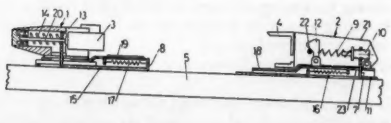
and resilient means operatively connected to said guide plate means and said guide rail means for urging said guide plate means toward said toe jaw, said resilient means being a tension spring connected to and extending between said offset axle portion and said guide plate means to effect both a thrust compensation and also an erecting of said ski brake.

4,288,094

SAFETY SKI BINDING

Josef Svoboda, Schwechat, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Feb. 21, 1979, Ser. No. 13,473
Claims priority, application Austria, Feb. 20, 1978, 1192/78
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—623 **5 Claims**



1. A safety ski binding, comprising:

base plate means adapted to be fixedly secured to the upper surface of a ski, said base plate means having first and second abutment members thereon longitudinally spaced from one another in a direction parallel to the longitudinal axis of said ski;

toe binding means adpteed to releasably engage the toe portion of a ski boot and first support means for supporting said toe binding means on said base plate means for movement relative to said base plate means in a direction parallel to said longitudinal axis of said ski, said toe binding means having release means thereon which includes a first spring support member movable with said toe binding means and a first release spring, said first release spring extending between said first abutment member and said spring support;

heel binding means adapted to releasably engage the heel portion of said ski boot and second support means for supporting said heel binding means on said base plate means spaced longitudinally from said toe binding means and for movement relative to said base plate means in a direction parallel to said longitudinal axis of said ski, said heel binding means having second release means thereon which includes a control cam movable with said heel binding means and a second release spring, said second release spring extending between said second abutment member and said control cam;

first stop means for limiting the movement of said heel binding means away from said toe binding means;

first resilient means for urging said heel binding means toward said toe binding means;

second resilient means for urging said toe binding means towards said heel binding means for assuring at least a movement of said heel binding means into engagement with said first stop means against the urging of said first resilient means in response to an insertion of said ski boot between said toe binding means and said heel binding means; and

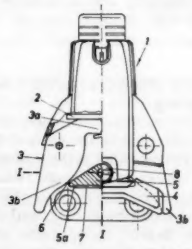
at least one of said first and second release springs being located on the side of the related abutment member towards the tip of the ski for facilitating, during a longitudinal movement of at least one of said toe binding means and said heel binding means relative to said ski during skiing, a reduction of the amount of spring force in said at least one of said first and second release springs that is being utilized to releasably hold said ski boot in said toe binding means and in said heel binding means to thereby facilitate an easy release of said ski boot from between said toe binding means and said heel binding means.

4,288,095

SAFETY SKI BINDING

Heinz Wittmann, and Alois Himmetsberger, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Sep. 6, 1979, Ser. No. 73,059
Claims priority, application Austria, Sep. 8, 1978, 6522/78
Int. Cl.³ A63C *9/10*
U.S. Cl. 280—625 **7 Claims**



1. A safety ski binding, comprising:

a binding housing mounted on the upper surface of a ski;

symmetrically arranged, two-arm sole holders pivotal between a sole holding position and a sole releasing position about ski-fixed axes which are arranged perpendicularly with respect to said upper surface and which each rest with one arm thereof against a side edge of the sole of a ski boot and a second arm thereof against one end of a resiliently biassed slide means whereby each of said sole holders is pivotal against the biassing force of said slide means, said resiliently biassed slide means effecting an urging of said sole holders toward said sole holding position;

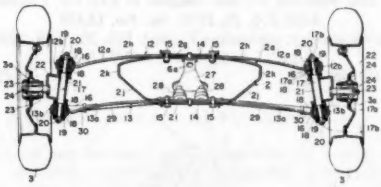
sole hold-down means and pivotal support means for freely pivotally securing said sole hold-down means to said binding housing and for movement between first and second positions, said sole hold-down means having a downwardly facing surface adapted to engage an upwardly facing surface on said sole of said ski boot, said sole hold-down means further having an upright surface means adapted to engage a side edge of said sole of said ski boot and being movable with said sole hold-down means about said pivotal support means between said first and second positions therefor, said hold-down means being urged from said second position to said first position in response to at least one of said sole holders being urged by said resiliently biassed slide means from said sole releasing position to said sole holding position.

4,288,096

FRONT WHEEL SUSPENSION MECHANISM FOR VEHICLE

Akito Enokimoto, Asaka; Toshio Tsuchiya, Kawagoe; Tatsuo Masuda, Niiza, and Suwaji Takano, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1979, Ser. No. 83,628
Claims priority, application Japan, Oct. 13, 1978, 53/125947
Int. Cl.³ B60G *3/18*
U.S. Cl. 280—694 **5 Claims**



1. A front wheel suspension mechanism for a vehicle having two front wheels and at least one rear wheel, comprising:

two transverse leaf springs mounted on a front portion of a frame of said vehicle;

said leaf springs being vertically spaced apart;

each said leaf spring having a mounting hole formed in each end portion thereof;

substantially vertically disposed king pins for supporting horizontal axles of said front wheels, said king pins being fitted in substantially upright positions between said vertically spaced apart leaf springs with the upper end portions of said king pins extending through said mounting holes of the upper one of said leaf springs and the lower end portions of said king pins extending through said mounting holes of the lower one of said leaf springs; and

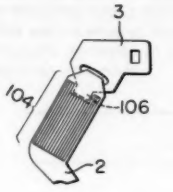
elastic members interposed between both end portions of said leaf springs and said end portions of said king pins, said elastic members being adjustably compressed axially of said king pins to elastically connect said leaf springs and said king pins.

4,288,097

SHOULDER BELT FOR SEAT BELT DEVICE

Takeo Ueda, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1978, Ser. No. 962,891
Claims priority, application Japan, May 12, 1978, 53-62665[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—802 **2 Claims**



1. A seat belt device comprising a belt for constraining the upper half of the body of a seat occupant, means for connecting an upper end of the belt to a side roof of a vehicle body, the connecting means comprising a tongue having an opening therein for attaching the tongue to the end of the belt, and tongue receiving means attached to the side roof for connecting the tongue thereto, and a length of the belt adjacent to the upper end of the belt being stiffened by a double layer sewn structure, the tongue having means adjacent to said opening projecting slightly into said double layer sewn structure for preventing said end of the belt from rotating with respect to said tongue, said double layer sewn structure supporting said length at an angle relative to a lower portion of the belt so that the belt does not bear against the neck or face of the seat occupant, and said double layer sewn structure further being flexible enough so that the belt may extend straight from the connecting means when the belt is pulled by the occupant in an emergency.

4,288,098

PISTON RETURN STOP DEVICE FOR TENSIONING DEVICE OF SEAT BELT

Noboru Tsuge, Kariya; Satosi Kuwakado, Aichi; Toshihiro Takei; Toshiaki Shimogawa, both of Okazaki, and Seiichi Chiba, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 6, 1979, Ser. No. 45,921
Claims priority, application Japan, Jun. 7, 1978, 53-77426[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—806 **20 Claims**

1. A seat belt tensioning device comprising:

a cylinder,

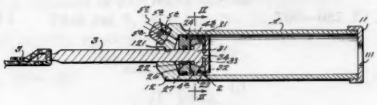
a piston slidably disposed within said cylinder,

said piston having a hole along the axis thereof and a plurality of guide grooves extending in the radial direction of said piston and communicating with said hole,

a tapered member having opposite ends and an inclined

surface rising toward one end, the other end being adapted for connection to a seat belt, said tapered member being slidably disposed within said hole,

connecting means connecting said piston and said one end and breakable by a predetermined tension force exerted on said other end of said tapered member,



stopper members respectively disposed in said piston guide grooves so as to be slidable in the radial direction of said piston, the inner surface of said stopper members being in contact with said inclined surface of said tapered member, the outer ends of said stopper members being in slidable contact with an inner wall of said cylinder, and

piston operating means for sliding said piston within said cylinder.

4,288,099

ADHESIVE CONNECTION OF A BODY HAVING A BASE PLATE WITH A SKI

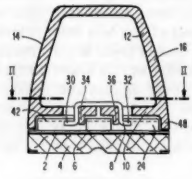
Günter Schwarz, Steinacherstr. 67, 8804 Au, Switzerland

Filed Jan. 18, 1979, Ser. No. 4,913

Claims priority, application Switzerland, Jan. 26, 1978, 836/78

Int. Cl.³ A63C *11/00*

U.S. Cl. 280—817 **12 Claims**



1. An adhesive connection between a body having a base plate and a ski, especially with the scoop-like tip portion of the ski, comprising:

a bendable attachment plate having an adhesive surface for securing the plate to the ski;

at least one attachment device for releasably connecting the attachment plate to the base plate of the body;

said base plate having at least one substantially tongue-shaped part, said tongue-shaped part being part of the base plate of said body and extending essentially parallel to a base surface of the body;

said attachment device being connected to an intermediate region of the attachment plate and to said at least one tongue-shaped part; and

said tongue-shaped part being narrower than the base surface of the body and being located in spaced relation from the attachment plate so that it is resiliently movable in the direction of said attachment plate.

4,288,100

BUCKLE AND STRAP AND METHOD FOR THE MANUFACTURE THEREOF, ESPECIALLY HAND STRAP AND BUCKLE FOR A SKI STICK

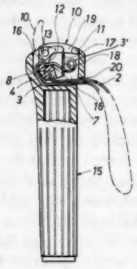
YrjöKuninkaantie Aho, 02160 Westend, Finland

Filed Dec. 29, 1978, Ser. No. 974,617

Claims priority, application Finland, Dec. 30, 1977, 773985

Int. Cl.³ A63C *11/22*

U.S. Cl. 280—821 **7 Claims**



1. Wrist strap and buckle for a ski stick located in a cavity space of a knob-shaped upper part of a handle at one end of the stick, the buckle being a separately removable member contained in the cavity space and comprising a frame portion having spaced-apart side faces and a transverse beam extending therebetween in which one end of the wrist strap is permanently secured and a locking lever pivotally journalled in said side faces over said transverse beam, a free end of the wrist strap being lockable at a desired point between a locking cam of said locking lever and said transverse beam, and an intermediate portion of the wrist strap extending exteriorly of the handle through a slot leading from the cavity space.

4,288,101

SKI STICK HANDLE

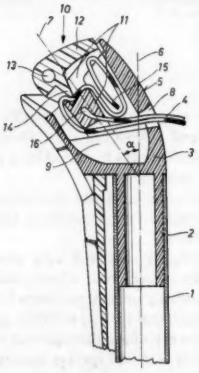
Yrjö Aho, Westend, Finland, assignor to Exel Oy, Finland

Filed Feb. 21, 1979, Ser. No. 13,450

Claims priority, application Finland, Feb. 20, 1978, 780552

Int. Cl.³ A44B *11/00*; A63C *11/22*

U.S. Cl. 280—821 **4 Claims**



1. A handle for a ski stick comprising a cylindrical fitting element (**2**, **2'**) for mounting on the upper end of a straight ski stick (**1**), a curved extension (**3**) having a convex side wall (**5**, **5'**), said extension being secured to and extending up above said fitting element, a cavity space (**9**) within the curved extension,

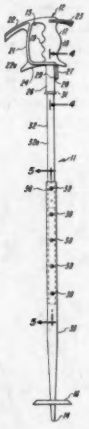
gripping means (**11, 12**) for a wriststrap disposed within the cavity space (**9**), and an outlet opening (**8**) for said wriststrap in the convex side wall (**5, 5'**) of the curved extension, said gripping means being formed as a buckle having a frame portion (**11**) and a lever portion (**12**) pivotably journalled to the frame portion (**11**) so as to lock a free end of said wriststrap therebetween, said lever portion (**12**) forming a cover for the upper end of said cavity space (**9**), the outlet opening (**8**) for said wriststrap (**4**) being located immediately adjacent to the ski stick center line (**6**), the gripping means (**11, 12**) being located on the other side of said center line (**6**), the outer surface of said convex side wall (**5, 5'**) extending above said outlet opening (**8**) so as to provide a high face surface, the center axis (**7**) of the curved extension (**3**) forming an angle (α) which is between 15° to 40° with respect to the center line (**6**) of the straight stick portion.

4,288,102

EXTENSIBLE SKI POLES WITH HAND GUARD GRIP

Paul C. Ramer, Golden, Colo., assignor to Alpine Research, Inc., Golden, Colo.

Filed Mar. 12, 1979, Ser. No. 19,829
Int. Cl.³ A63C *11/22*
U.S. Cl. 280—823 **6 Claims**



1. A pair of ski poles, each ski pole comprising, in combination:

a hand grip having a gripping portion and a hand guard operatively connected to and extending a predetermined parallel distance along said gripping portion, said hand guard terminating near the uppermost portion of said gripping portion, and a downwardly curving arresting spur extending at an acute angle downwardly away from said hand guard and said grip;

a shaft operatively connected to said hand grip; and

a basket operatively connected to said shaft.

4,288,103

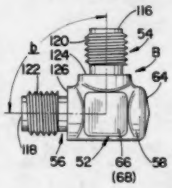
FLUID FITTING HAVING GRIPPING BASS MEANS FOR CHUCKING

Bernard J. Gallagher, Mayfield; Erling G. Wennerstrom, and Mark R. Houdek, both of Cleveland, all of Ohio, assignors to Cajon Company, Solon, Ohio

Filed Mar. 27, 1979, Ser. No. 24,393
Int. Cl.³ F16L *43/00*
U.S. Cl. 285—39 **2 Claims**

1. A fluid fitting comprising:

a pair of elongated fitting branches angularly disposed relative to each other; a fluid passageway extending longitudinally through each of said branches into communication with each other, said branches adapted to be placed in cooperative communication with the ends of a pair of adjacent fluid conduit means for placing said conduit means in fluid communication with each other; and, a separate gripping boss area having a length of approximately 2.286 mm with said boss area and one of said



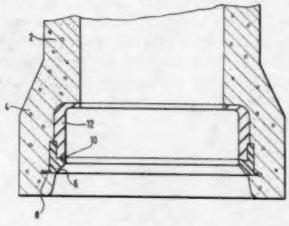
branches spaced therefrom having circular cross sections and defining gripping means, said gripping means permitting said fitting to be gripped at spaced apart locations by chucking means during fitting manufacture for providing fitting stability and allowing at least said passageways to be more accurately generated at a desired angular relationship relative to each other.

4,288,104

PIPE SECTION, PREFERABLY A CONCRETE PIPE SECTION

Olof Nordin, Värnamo, Sweden, assignor to Forsheda Gummifabrik AB, Forsheda, Sweden

Filed Sep. 5, 1979, Ser. No. 72,574
Claims priority, application Sweden, Sep. 8, 1978, 7809451
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—45 **5 Claims**



1. In combination, a pipe of the type which is manufactured by moulding the pipe and material in a mould, an annular sealing ring connected to said pipe near one end thereof and adapted for sealingly connecting said pipe to another pipe, said sealing ring including ring an annular inwardly projecting sealing portion and a further portion located axially inward of said sealing portion relative to the end of said pipe, said sealing portion and said further portion having surfaces forming an axially inwardly facing pocket, and a protector for said surfaces of said sealing ring portions comprising an annular element in contact with said pipe and said surfaces of said sealing ring portions, said annular element being easily removable from said pipe at the place where said pipe is to be used, said pipe being moulded against said annular element.

4,288,105

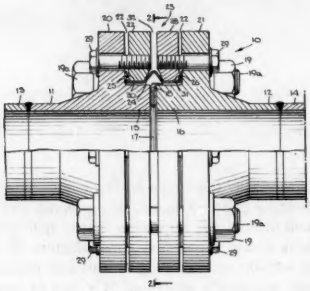
PIPE UNION WITH BOTH PRE-LOAD DEPENDENT AND INDEPENDENT SEALS

Irving D. Press, West Orange, N.J., assignor to Resistoflex Corporation, Roseland, N.J.

Continuation-in-part of Ser. No. 13,676, Feb. 21, 1979. This application Oct. 31, 1979, Ser. No. 90,037

Int. Cl.³ F16L *9/14*

U.S. Cl. 285—55 **26 Claims**



1. A disconnectable pipe union comprising in combination first and second union members, means for establishing between said union members a first circumferential seal whose sealing effectiveness is a function of its pre-loading and which is fluid-tight when pre-loaded above a given level, means constructed and arranged to be placed under tension to draw said first and second union members toward each other to provide at least said given level of pre-loading for said first seal, said union members being related to said means for establishing a first seal such that at least corresponding portions of said union members radially outward of said first seal remain separated axially with at least a certain minimum gap therebetween when the union members are drawn together with said first seal established therebetween, axially extensible sealing means constructed and arranged to be separably fastened to both of said union members for establishing a second fluid-tight circumferential seal within said gap surrounding concentrically said first seal and operative independently of said pre-loading at least to contain any fluid leaking past said first seal due to diminution of said pre-loading below said given level anywhere circumferentially around said first seal, and means for establishing a separable reusable connection between said union members and the corresponding end of said axially extensible sealing means.

4,288,106

ROTATABLE SWIVEL FOR ONE OR MORE CONDUITS

Jan A. Foolen, Eze-sur-mer, France, assignor to Single Buoy Moorings Inc., Fribourg, Switzerland

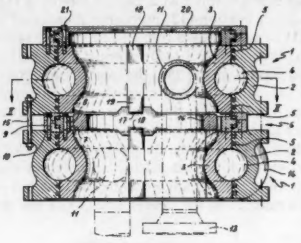
Filed Dec. 20, 1979, Ser. No. 105,523

Claims priority, application Netherlands, Dec. 22, 1978, 7812499

Int. Cl.³ F16L *39/04*

U.S. Cl. 285—136 **7 Claims**

1. In a rotatable swivel for conduits comprising annular chambers each of which includes a fixed wall portion and a wall portion rotatably mounted with respect thereto, said wall portions being supported on each other by means of radially and axially operative bearings and being sealed with respect to each other, each wall portion having inlet and outlet line connections; the improvement in which all chambers are the same in such a manner that all inner wall portions (3) are identical and all outer wall portions (2) are identical, said inner wall



portions (3) surrounding a central aperture through which said connections (11, 13) run.

4,288,107

TERMINATION CONSTRUCTION OF A CABLE COMPRISED OF BUNDLED TUBES

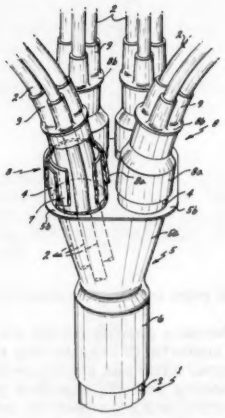
Hansjürgen Schwartze, Osnabrück, Fed. Rep. of Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte A.G., Hanover, Fed. Rep. of Germany

Filed Sep. 19, 1978, Ser. No. 943,737

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1977, 7728990; Mar. 11, 1978, 2810708

Int. Cl.³ F16L *39/00*

U.S. Cl. 285—137 R **13 Claims**



1. In a construction for placement at an end of a bundle of tubes, a member having a neck portion placed in shrink fit onto the bundle, the member having a bottom plate from which extend a plurality of different sleeves, each said sleeves being passed through by at least one of said tubes, said sleeves being placed in shrink fit around and on the respective tube or tubes.

4,288,108

COLLAR COUPLED PLASTIC CONDUIT

Kenneth F. Streit, Mt. Prospect, Ill., assignor to Techplastics, Inc., West Chicago, Ill.

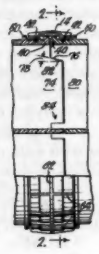
Filed Jul. 27, 1979, Ser. No. 61,356

Int. Cl.³ F16L *39/00*

U.S. Cl. 285—137 R **17 Claims**

1. A plastic conduit section for connection to similar conduit sections, comprising: a plurality of interconnected enclosing

walls defining an open ended conduit passageway with end portions having on their outside surfaces a peripheral, circumferential groove adjacent the free ends, and a circumferential flange adjacent said groove; a resilient conduit coupling collar having a plurality of parallel interconnected walls at least at one of its ends defining an open ended closure with said collar walls having inner transverse dimensions generally equal to the outer transverse dimensions of the outside surfaces of said end portions adjacent said grooves, said collar having a length



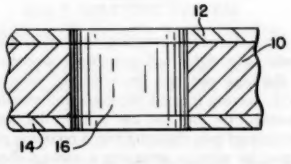
sufficient to telescope upon and join together the end portions of two adjacent conduit sections; a gasket carried within each of said grooves to seal the joints between the exterior of said conduit end portions and the interior of a coupling collar telescoped over that end portion; and means, integral with and adjacent said end portions and cooperating with the interior surfaces of said coupling collar, for mechanically locking said two adjacent conduit sections and said coupling collar together by snap fitting action and said grooves being located intermediate said flange and said means.

4,288,109

CORROSION RESISTANT ASSEMBLY AND METHOD OF MAKING IT

Claude E. Ellis, Wausau, Wis., assignor to Sterling Drug, Inc., New York, N.Y.

Filed Jan. 19, 1979, Ser. No. 4,662
Int. Cl.³ F16L *3/04*
U.S. Cl. 285—158 **6 Claims**



1. A joint for a tube to extend through a steel sheet, there being a hole through the steel sheet, corrosion resistant material at both sides of the steel sheet, a corrosion resistant sleeve located in hole welded to the corrosion resistant material at both sides of the steel sheet, thus isolating the hole from the steel sheet by corrosion resistant material, and a corrosion resistant tube in the corrosion resistant sleeve, said tube being secured to the sleeve at one side only of the sheet,

the corrosion resistant sleeve terminating at the exterior surfaces of the corrosion resistant material covering the sides of the steel sheet, and

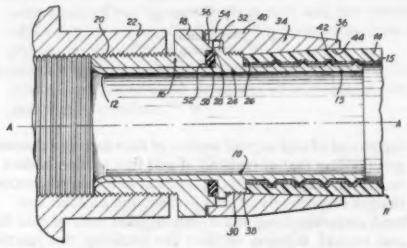
adjacent corners of the corrosion resistant sleeve and sheets on both sides of the tube sheet being bevelled forming V-grooves for welding.

4,288,110

END FITTINGS FOR FLEXIBLE METALLIC CONDUITS

David Grenell, Laurelton, N.Y., assignor to Allen-Stevens Corp., Woodside, N.Y.

Filed Oct. 9, 1979, Ser. No. 82,717
Int. Cl.³ F16L *33/24*
U.S. Cl. 285—174 **8 Claims**



1. An end fitting for a flexible metallic conduit having an outer deformable wall in which electric cables are received, comprising:

(a) a tubular metallic body elongated along a longitudinal axis and bounding an interior in which the electric cables are received, said body having a radially outwardly flaring end portion and an opposite threaded end portion for threadedly engaging the flexible metallic conduit, said body having a radially outwardly extending stationary projection which is fixedly anchored on said body for non-movement relative thereto intermediate the end portions thereof;

(b) a tubular metallic sleeve concentrically surrounding and being rotatably mounted on said body between said stationary projection and said flared end portion, said sleeve having a threaded end portion for threadedly engaging a support, and an opposite abutment end portion which is axially spaced from said stationary projection;

(c) a tubular metallic collar concentrically surrounding said threaded end portion of said body and having an inner circumferential surface which bounds therewith an annular space in which the flexible metallic conduit is received, said collar being threadedly mounted on said stationary projection for continuous adjustable axial movement relative thereto; and

(d) resilient sealing means located between and sealingly engaging both said stationary projection and said abutment end portion, said stationary projection being nonmovable relative to said resilient sealing means for providing a wear-and fluid-resistant seal between said body and said sleeve to thereby protect the electric cables, said resilient sealing means being stressed for affirmatively urging said sleeve away from said stationary projection and into electro-mechanical engagement with said flaring end portion of said body.

4,288,111

JOINT CONSTRUCTION FOR SHEET METAL DUCTS

Roger A. Feutz, Grand Rapids, Mich., assignor to Enterprise Construction Services, Inc., Grand Rapids, Mich.

Filed Jan. 21, 1980, Ser. No. 113,630
Int. Cl.³ F16L *43/00*
U.S. Cl. 285—183 **11 Claims**

1. A joint assembly for ducts comprising:

a first section of duct defined by a wall having a first flange extending radially outwardly from said wall, a second flange extending from an end of said first flange axially aligned with and radially outwardly offset from said wall, and a third flange extending radially inwardly from an end of said second flange, said first, second and third flanges defining an end of said first section of duct; and having a

wall thickness substantially the same as the wall thickness of said section of duct;

a second section of duct defined by a wall having a fourth flange extending radially outwardly and a fifth flange extending from an end of said fourth flange axially aligned with and radially outwardly offset from said wall of said second section of duct, said fourth and fifth flanges defining an end of said second section of duct having a diameter greater than that of said end of said first section of duct to receive in mating sealed engagement said third and second flanges respectively of said first section of duct; and

a band circumscribing and overlying said ends of said first and second sections of duct for securing the junction therebetween.

4,288,112

CONNECTING PIECE FOR SUPPLY LINES CARRYING GASEOUS OR FLUID MEDIA

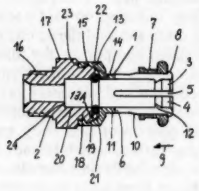
Kurt Stoll, Lenzhalde 72, Esslingen, Fed. Rep. of Germany

Filed Apr. 19, 1979, Ser. No. 31,492

Claims priority, application Fed. Rep. of Germany, May 3, 1978, 7813457

Int. Cl.³ F16L *33/00*

U.S. Cl. 285—238 **6 Claims**



1. A connecting piece for supply lines carrying gaseous or fluid media, comprising:

a first elongated and hollow connecting member having a first central body segment with an enlarged end structure on one end terminating in a first axially facing surface which has a first axially facing recess therein communicating with the interior of said hollow connecting member and opening in a direction remote from said first central body segment, the bottom of said first recess defining a second axially facing surface extending parallel to said first surface, said first recess having an annular recess on the internal surface thereof intermediate said first and second surfaces, a supply line clamping means connected to said first central body segment on an end thereof remote from said enlarged end structure;

a second elongated and hollow connecting member having a second central body segment with an end segment extending axially away from said second central body segment and a sleeve segment extending axially away from said second central body segment on a side thereof opposite said end segment, said sleeve segment having a cross-sectional size less than the cross-sectional size of said second central body segment to thereby define a third axially facing surface facing in a direction toward said first surface on said first connecting member, said sleeve terminating in a fourth axially facing surface parallel to said third surface, said fourth surface having a second axially facing recess therein communicating with the interior of said second connecting member, the bottom of said second recess defining a fifth axially facing surface extending parallel to said third and fourth surfaces, the axial spacing between said third and fourth surfaces on said second connecting member being equal to the axial spacing between said first and second surfaces on said first connecting member, said sleeve segment having an annular projection on the external surface thereof intermediate said third and fourth surfaces;

said sleeve segment being received in said first recess with said third surface thereof engaging said first surface and with said fourth surface engaging said second surface, a compressible seal member received in said second recess and being compressed between said second and fifth surfaces, said annular projection being operatively received in said annular recess to hold said first and second connecting members in a coupled relationship and said first and third surfaces as well as said second and fourth surfaces in engagement with each other.

4,288,113

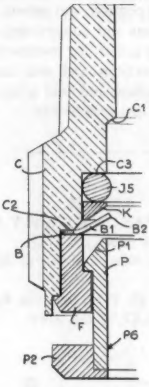
QUICK CONNECTOR COUPLING FOR SEMI-RIGID HOSE

Charly J. Saulnier, Bonne, France, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jul. 6, 1979, Ser. No. 55,400

Int. Cl.³ F16L *33/00*

U.S. Cl. 285—238 **4 Claims**



1. A quick connector coupling for semi-rigid hose of the type providing a tight, self-gripping connection by simply inserting the hose end into the coupling, which comprises a hollow body having formed therein a first shoulder constituting an abutment for the hose end to limit the hose length that can be introduced into the coupling, a retaining ring having an external annular portion engaging a second shoulder of said hollow body and a central portion apertured and formed with a plurality of radial slits providing as many lugs adapted to grip said hose to counteract any outward movement thereof, means for locking the retaining ring in place, a push member adapted to slide in relation to said body and formed with an internal tapered head adapted to engage said lugs so as to bend them away from the hose surface when said push member is moved inwardly of said body and resilient sealing means disposed axially inwardly of said lugs, wherein abutment means is resiliently fitted in said hollow body axially inwardly of said lugs in order to permit a bending movement of said lugs by said push member to provide an aperture substantially greater than a normal movement and a normal aperture and to prevent an excess amount of said bending, said sealing means comprising an O-ring disposed between a shoulder provided in said hollow

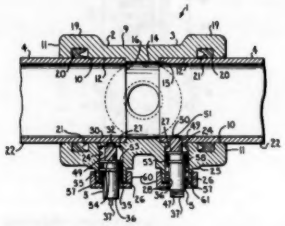
body and said abutment means to permit a slight axial movement of said abutment means.

4,288,114

FITTING WITH BIASED LOCKING DEVICE FOR COUPLING PIPES

Arne H. Hansen, Doylestown, Pa., assignor to Meyertech Incorporated, Lakewood, Colo.

Filed Nov. 28, 1979, Ser. No. 98,130
Int. Cl.³ F16L *39/00*
U.S. Cl. 285—317 **9 Claims**



1. A fitting for connection to a pipe to form a joint therewith comprising:

(a) a generally cylindrical wall defining a pipe end receiving socket having an exterior surface and a pipe cradling interior surface;

(b) a bore extending at least partially through said wall;

(c) a locking device engaged in said bore and having a shaft with a head end and an opposite tip end extensible inwardly of said interior surface a sufficient distance to extend at least partially through and at least partially pierce a wall of a pipe end received in said socket for locking said pipe end in said socket;

(d) a ring seal surrounding said shaft and forming a fluid-tight seal between said shaft and said socket; and

(e) resilient means urging said tip end inwardly of said interior surface for maintaining engagement with said pipe end received in said socket and a retainer normally containing said tip end within said bore and spaced from said interior surface whereby said locking device is in a ready-to-use position; and wherein said resilient means urges said tip end against said retainer.

4,288,115

DUCT JOINTING SYSTEM

Michael T. Sullivan, 36 Hess St. South, Hamilton, Ontario, Canada

Filed Oct. 3, 1979, Ser. No. 81,501
Claims priority, application Canada, Oct. 19, 1978, 313737
Int. Cl.³ F16L *23/00*
U.S. Cl. 285—363 **6 Claims**

1. A connection means for connecting adjacent ends of rectangular sheet metal ducts, comprising:

a plurality of elongated hollow flange members each having a channel portion with a mouth opening to receive therein an end face of a wall of said sheet metal duct and to extend along a major part of the length thereof, and a transverse hollow portion upstanding from the channel portion, said transverse portion having a generally planar upstanding outer side face;

the channel portion extending beyond the plane of said outer face;

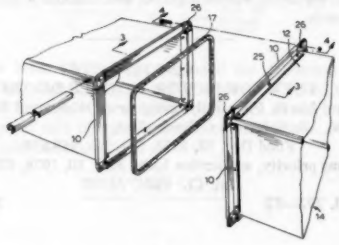
the transverse portion having openings at each longitudinal end thereof;

a substantially planar, generally L-shaped corner connecting piece, having co-planar limbs, said limbs being adapted to be received in the openings in the longitudinal ends of adjacent ones of said hollow flange members so as to link a pair of flange members together in mutually right angular disposed relationship with said planar outer side faces substantially in a common plane;

said corner connecting piece having a first laterally offset portion at its radially inner central corner section and a second laterally offset portion at its radially outer central corner section, the first and second offset portions being offset in opposite directions from one another;

said corner connecting piece being adapted to be assembled with a pair of said flange members with said first laterally offset portion being offset in the direction away from the planar outer side faces thereof;

a gasket adapted to be placed in sealing engagement with the planar upstanding outer side faces of an adjacent pair of said flange members;



the channel portions of said profile members extending beyond the plane of said outer face so as to form protuberances extending toward each other in the assembled joint, to grip the gasket in tight sealing engagement between opposed pairs of said flange members;

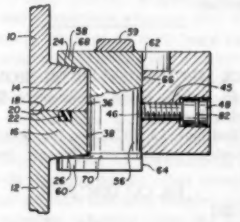
each of the first and second offset portions of the corner connecting piece being offset from the main plane thereof sufficiently to protrude a distance of about one wall thickness of the flange member said first offset portion thus constituting means permitting end faces of said walls of the duct in the region of said first offset to project beyond the plane of said first offset portion towards said outer side face to grip said gasket in sealing engagement between opposed such regions of said end faces of opposed ducts.

4,288,116

APPARATUS FOR FASTENING FLANGED TUBULAR MEMBERS

Max P. Schlienger, Ukiah, Calif., assignor to Retech, Inc., Ukiah, Calif.

Filed Apr. 20, 1979, Ser. No. 31,892
Int. Cl.³ F16L *17/00*
U.S. Cl. 285—364 **35 Claims**



1. Apparatus for securing to each other and sealing open ends of generally tubular pressure vessels fitted with radially outwardly protruding end flanges having back sides which face away from each other, the apparatus comprising: a plurality of clamping spools each having a shank and a rim protrud-

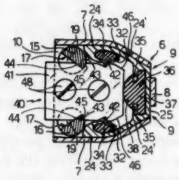
ing radially outward from each shank end, the rims defining opposing faces dimensioned for placement over the flanges and overlapping the back sides; a spool retaining ring having an inner diameter greater than an outer diameter of the flanges for placement thereover, the ring including means for receiving the spools and for positioning the spools between the ring and the flanges when the former is placed over the latter; means for movably connecting the spools to the retaining ring so that the ring and the spools can be placed as a unit into radial alignment with the flanges; means for moving the spools towards the flanges and for subjecting the spools to a force acting in the same direction; and means for establishing firm contact between the rims and the flanges and for generating a force with each spool which acts on the respective back sides of the flanges in opposite, axial directions so as to secure the flanges and therewith the vessels together and establish a seal between the vessels.

4,288,117

LOCK FOR MOTOR VEHICLE DOORS

Giovanni Nardi, Pisa, Italy, assignor to Whitehead Motofides, S.p.A., Via Salvatore Orlando, Italy

Filed Dec. 15, 1978, Ser. No. 969,676
Claims priority, application Italy, Mar. 10, 1978, 67515 A/78
Int. Cl.[2] E05C *13/00*
U.S. Cl. 292—52 **25 Claims**



1. A lock for motor vehicle doors, comprising a striker member arranged for engagement and disengagement by means comprised in a mechanism of said lock, the mechanism being supported by a first plate, and the striker member and means being disposed on a part fixed relative to the door and on the door respectively, or vice versa, wherein said means comprise at least one pair of engagement members for said striker which are rotatable on pins, and the disengagement load exerted between said member and said means is opposed only by component forces passing substantially through the axis of said pins, wherein the contact engagement between said pair of engagement members and said striker member occurs, at least partially, on surfaces which are concentric about the axis of said pins, and pertain respectively to said engagement members and striker member.

4,288,118

DOOR LOCK MECHANISM OF MICROWAVE OVEN

Michio Ohkado, Sakai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 13, 1978, Ser. No. 960,029
Claims priority, application Japan, Nov. 16, 1977, 52/155098[U]
Int. Cl.[3] E05C *3/06*
U.S. Cl. 292—201 **7 Claims**

1. A lock mechanism for an oven generation circuit comprising:

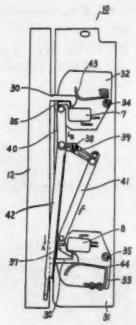
a door switch being controlled by the opening and closing of an oven door;

a cook switch which may be activated when said oven door is in the closed position;

a generation circuit operatively connected to a power source, a heat generating source, said door switch and said cook switch;

said heat generating source being power supplied by the activation of both the door switch and the cook switch;

first means for controlling the activation of the cook switch; and



second means responsive of a door opening mechanism for controlling the opening and closing of the oven door, thereby controlling the activation of the door switch;

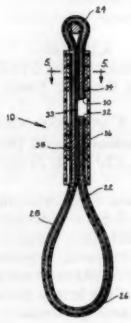
wherein the second means is prevented by the first means from controlling the opening of the oven door while the first means is activated to provide the activation of the heat generating source.

4,288,119

DOOR LOCKING CABLE

Robert G. Geiger, Elkhart, Ind., assignor to Air-Flo Co., Inc., Elkhart, Ind.

Filed Jul. 5, 1979, Ser. No. 54,665
Int. Cl.[3] E05C *17/04*
U.S. Cl. 292—262 **6 Claims**



1. A cable door lock comprising a flexible metal cable bent to define a loop at one end and including securing means for attaching the cable to a door frame at the opposite end, said loop being of a size to slip around a doorknob, metal means clamping said loop defining cable portion to an intermediate portion of said cable, and a sleeve encircling and rotatable on the major portion of said cable and clamping means between said loop and said securing means.

4,288,120

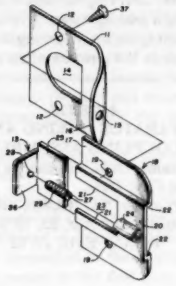
DOOR LATCH ASSEMBLY

Donald H. Moore, Rte. #3, Cannon Falls, Minn. 55009

Filed May 14, 1979, Ser. No. 38,920

Int. Cl.³ E05C *13/00*

U.S. Cl. 292—341.18 **6 Claims**



1. A latch assembly comprising:

a striker plate having front and rear surfaces and having a latching notch therein;

an adjustable latching surface disposed within said latching notch and adapted for latching engagement with a corresponding protruding latch member for retaining the same in a latched position, said latching surface comprising an "L" shaped slide member slidably associated with a portion of the rear surface of said striker plate;

slide rail means for slidably receiving said slide member, said slide rail means including a slide rail plate having a pair of generally parallel peripheral edges connected in face-to-face registration with the rear surface of said striker plate on either side of said latching notch and an intermediate section disposed between said peripheral edges, said intermediate section being spaced from, but in parallel relationship to, the rear surface of said striker plate and having portions extending inwardly from each of said peripheral edges for slidably retaining said slide member;

threaded means for adjusting the position of said latching surface, said threaded means having a portion connected with said slide rail plate and being disposed on the opposite side of said slide rail means from said striker plate.

4,288,121

TRANSPORT CAR, PARTICULARLY FOR TRANSPORTING FILES, WITH FRONTALLY ARRANGED BUMPER

Edelbert Wiechert, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

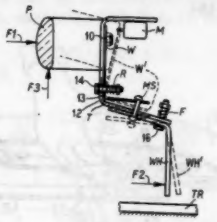
Filed Sep. 14, 1979, Ser. No. 75,659

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1978, 2846245

Int. Cl.³ B60R *19/02*

U.S. Cl. 293—4 **4 Claims**

1. A rail-bound transport car with self-drive means and frontally arranged bumper means (P) and with switch contact means for actuation upon frontal impact of the bumper means against an obstacle for influencing the transport car self-drive means; said bumper means comprising a bumper providing a handle contour; a mounting angle (T); a bumper movement sensing lever (W) having said bumper arranged thereon, and being pivotably mounted on said mounting angle (T), and having actuation means for actuating said switch contact means upon pivotal movement of said bumper movement sensing lever (W) in response to frontal impact of the bumper against an obstacle; reset spring means (R) acting on said bumper movement sensing lever (W) to oppose the pivotal movement thereof, a catch (MS); and an angle lever (WH) having a mounting arm and a depending arm, and the mounting arm being rotatably mounted below said bumper movement sensing lever (W) on said mounting angle (T) and being coupled with said bumper movement sensing lever (W) by said catch (MS),



said angle lever (WH) being arranged for deflection upon impact of the depending arm of said angle lever (WH) against an obstacle located on the rails below the area of said bumper, so as to pivot said bumper movement sensing lever (W) by means of said catch (MS).

4,288,122

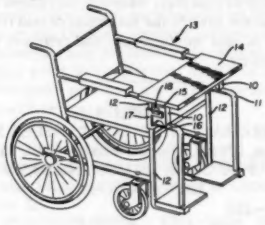
WHEEL CHAIR TABLE CLAMP

Lloyd F. Meek, 4589 Phillips Rice Rd., Cortland, Ohio 44410

Filed May 9, 1979, Ser. No. 37,309

Int. Cl.³ A47C *7/70*

U.S. Cl. 297—153 **4 Claims**



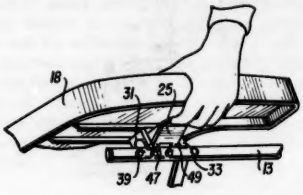
1. A clamp is adapted to mount a table on a wheel chair having a pair of horizontally spaced vertically disposed tubular frame members, each having a horizontal tubular frame member intersecting and projecting therefrom with said horizontal members parallel to each other, said clamp comprising a pair of vertically disposed body members adapted to hold a table on said horizontal frame members adjacent said vertical frame members, a clamping member on each body member, pivot means pivotally mounting each clamping member to its respective body member so that the clamping member is disposed adjacent a vertical frame member, said clamping member having opposite vertical sides, each of which sides having a right angularly disposed tab thereon, said tabs on each clamping member vertically spaced on the clamping member and projecting towards the tabs on the other clamping member with the lower tab on each clamping member being disposed below its body member, whereby when the body members have their lower edges mounted on the horizontal frame members, each clamping member is pivoted to clamp the tabs on opposite sides of a vertical frame member with the lower tab disposed below the horizontal frame member to thereby secure the body member and a table carried thereby to the horizontal and vertical frame members against vertical and horizontal movement.

4,288,123

HIGH CHAIR TRAY ATTACHMENT MECHANISM

Richard E. Cone, Dayton, Ohio, assignor to Questor Corporation, Toledo, Ohio

Filed Oct. 11, 1979, Ser. No. 83,796
Int. Cl.[3] A47B *39/00, 39/04*
U.S. Cl. 297—154 **4 Claims**



1. In combination with the arms of a high chair, a tray, and a swivel mounted on the underside of said tray and removably securable to one of said arms, the improvement comprising

bracket means mounted on the underside of said tray in juxtaposition with said other arm;

depending legs extending downward from said bracket so as to form a recess for said other arm;

at least one aperture in the outer surface of said other arm;

a plate rotatably mounted on said underside of said tray adjacent said depending legs;

spring means for rotatably biasing said plate away from said underside of said tray and against said depending legs;

a pin extending from said plate and being of a dimension to mate with said aperture; and

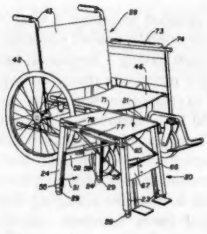
a flange extending outwardly from said plate toward the outer edge of said tray, whereby movement of said flange in a direction toward the underside of said tray overcomes the bias of said spring means and removes said pin from said aperture.

4,288,124

WHEELCHAIR-CARRIED TRANSFER STOOL

Rex Hamilton, 2701 S. Watson, Visalia, Calif. 93277

Filed Oct. 1, 1979, Ser. No. 80,580
Int. Cl.[3] A47C *13/00*
U.S. Cl. 297—217 **13 Claims**



1. A transfer stool attachable to a wheelchair comprising:

a seat portion;

leg means secured to said seat portion and formed for movement to and from a collapsed condition at which said leg means and seat portion are in close compact proximity to each other and an extended condition at which said leg means is extended for support of an individual sitting on said seat portion, said leg means and seat portion being further formed to provide a relatively narrow width dimension when said leg means is in said extended condition;

wheel means rotatably mounted to said leg means for rolling support of said stool when said leg means is in said extended condition; and

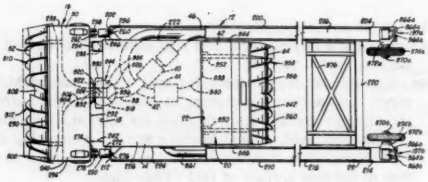
mounting means secured to at least one of said seat portion and said leg means and formed for cooperative engagement with a wheelchair mount provided on a wheelchair, said mounting means being further formed for selective removable mounting of said transfer stool to said wheelchair mount for carrying of said transfer stool by said wheelchair when said leg means is in said collapsed condition, said mounting means mounting the collapsed stool on said wheelchair in the position of an armrest.

4,288,125

MINING APPARATUS HAVING AN IMPROVED COUPLING ASSEMBLY

James E. Ingle, Edmond, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 768,650, Feb. 14, 1977, Pat. No. 4,160,566. This application Apr. 23, 1979, Ser. No. 32,465
Int. Cl.[3] E21C *27/02*
U.S. Cl. 299—30 **61 Claims**



1. A mining apparatus for forming a borehole in an earth formation comprising:

a miner, comprising:

a frame, having a forward end and a rearward end; and

a forward cutter assembly connected to the forward end of the frame for excavatingly engaging the earth formation;

at least one carrier, each carrier having a forward end and a rearward end, the forward end of one of the carriers being removably connectable to the miner and the rearward end of the carrier being removably connectable to the forward end of one other carrier, each carrier comprising:

a carrier frame, having a forward end, a rearward end, a first side and a second side, comprising:

a first barrier beam having a forward end and a rearward end;

a second carrier beam having a forward end and a rearward end, the second carrier beam being spaced in a substantially parallel relationship with the first carrier beam, and the forward ends of the first and second carrier beams forming the forward end of the carrier frame and the rearward ends of the first and second carrier beams forming the rearward end of the carrier frame; and

means for supporting the first and second carrier beams in the substantially parallel, spaced apart relationship;

coupling means comprising:

a first male coupler secured to the forward end of the first carrier beam;

a second male coupler secured to the forward end of the second carrier beam, the first and second male couplers being secured in a substantially parallel spaced relationship on one end of each of the carrier frames;

a first female coupler secured to the rearward end of the first carrier beam;

a second female coupler secured to the rearward end of the second carrier beam, the first and second female couplers being secured in a substantially parallel relationship on one end of each of the carrier frames, opposite the end with the male couplers, the first and second female couplers on one carrier frame being substantially

alignable with the first and second male couplers on another carrier frame so that the first and second female couplers on one carrier frame operatively engage the first and second male couplers of another carrier frame to connect the respective ends of the two carrier frames;

a first female coupler and a second female coupler, the first and second female couplers being secured to the rearward end of the frame in a substantially parallel, spaced-apart relationship, the first and second female couplers on the miner being substantially alignable with the first and second male couplers on one end of one of the carrier frames so that the first and second female couplers of the miner operatively engage the first and second male couplers of the carrier frame to connect the miner to the carrier frame; and

means connected to each carrier for movingly supporting each carrier, comprising:

a first axle secured at one end thereof to the first female coupler connected to the first carrier beam;

a second axle secured at one end thereof to the second female coupler connected to the second carrier beam;

a first wheel mounted on the first axle; and

a second wheel mounted on the second axle.

4,288,126

AIR ASSISTED BRAKING SYSTEM

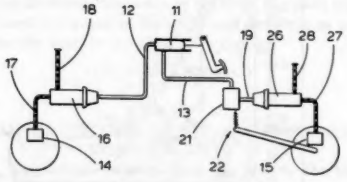
David Parsons, Kenilworth, and Harold Hodkinson, Finham, both of England, assignors to Automotive Products Limited, Warwickshire, England

Filed Aug. 22, 1979, Ser. No. 68,535

Claims priority, application United Kingdom, Sep. 1, 1978, 35259/78

Int. Cl.³ B60T *8/26*

U.S. Cl. 303—6 C **4 Claims**



1. An air powered braking system for a vehicle and comprising;

a front wheel air powered brake system;

a rear wheel air powered brake system;

a pair of air pressure valves each of which regulates the air pressure in its respective one of the front or rear brake systems, said air valves being hydraulically controlled so that the air pressure in each of said front and rear systems is proportional to the hydraulic pressure;

a hydraulic master cylinder operable by the vehicle driver and independently connected to each of air valves so as to generate said hydraulic pressure;

and a pressure reducing valve interposed in the connection between the master cylinder and the rear brake system air valve so that on operation of the reducing valve to reduce the hydraulic pressure to that air valve the air pressure in the rear brake system relative to that in the front brake system is also reduced.

4,288,127

ANTI-LOCK CONTROL SYSTEM

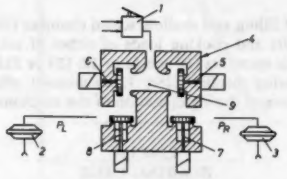
Heinz Leiber, Leimen; Wolf-Dieter Jonner, Sandhausen, and Hermann-Josef Goebels, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1979, Ser. No. 53,653

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830809

Int. Cl.³ B60T *8/10*

U.S. Cl. 303—111 **8 Claims**



1. An anti-lock control system for the brakes for each of two wheels on one axle of a vehicle which brakes are actuated by a pressure medium from a pressure source comprising, in combination, a signal transducer **30** associated with each wheel of one axle for providing a signal characterizing the wheel motion behavior, an evaluator circuit **31**, means for supplying the signals to said evaluator circuit to generate brake pressure control signals, brake pressure control devices for separately influencing the brake pressure on said two wheels, means for supplying said brake pressure control signals to said brake pressure control devices, said evaluator circuit being provided with control means which in the event of a pressure drop on the brake of one wheel prevents a substantial pressure increase on the brake for the other wheel and in the event of a subsequent pulsated pressure increase on the first brake permits only a synchronously pulsated pressure buildup on the other brake, a fluid pressure line having a common section and a branching point for connecting said pressure source to said wheel brakes, said branching point being disposed in one of the immediate vicinity of the brake pressure control devices and in the brake pressure control devices themselves.

4,288,128

SELF-ALIGNING THRUST BEARING

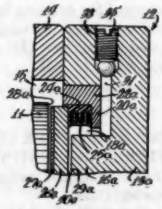
Alan W. Wells, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00804, §371 Date Oct. 1, 1979, §102(e) Date Oct. 1, 1979, PCT Pub. No. WO81/00898, PCT Pub. Date Apr. 2, 1981.

This PCT application filed Oct. 1, 1979, Ser. No. 95,196

Int. Cl.³ F16C *33/74*

U.S. Cl. 308—36.2 **17 Claims**



1. In a mechanism which includes first (**10** and **11**; **111**) and second (**12**; **112**) relatively rotatable members, the first of said members having a thrust surface (**28***a*; **128***a*) and the second of said members having a thrust abutment surface (**29***a*; **129***a*) facing and very close to said thrust surface (**28***a*; **128***a*), self-aligning thrust bearing means (**24***a*–**26***a*; **124***a*–**126***a*) comprising in combination:

a thin bearing member (**26***a;* **126***a*) between said thrust surface (**28***a;* **128***a*) and said thrust abutment surface (**29***a;* **129***a*), the area of said bearing member (**26***a;* **126***a*) being large in proportion to its thickness;

peripheral sealing means (**24***a;* **124***a*) in sealing relationship with a face of said bearing member (**26***a;* **126***a*) and with one (**28***a* or **29***a;* **128***a* or **129***a*) of said surfaces to define a shallow sealed chamber (**30***a;* **130***a*) between said bearing member (**26***a;* **126***a*) and said one (**28***a* or **29***a;* **128***a* or **129***a*) of said surfaces, said sealing means (**24***a,* **124***a*) being substantially uniformly axially compressible and extensible;

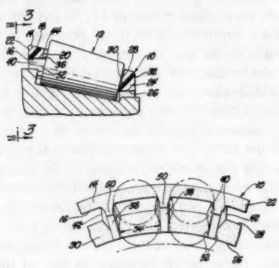
and liquid filling said shallow sealed chamber (**30***a;* **130***a*) so that axial and cocking loads of either of said relatively rotatable members (**10** and **11** or **12**; **111** or **112**) may rock the bearing member (**26***a;* **126***a*) without effective axial displacement during operation of the mechanism.

4,288,129

BEARING CAGE

Robert M. Ryanen, Union Lake, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Apr. 11, 1980, Ser. No. 139,384
Int. Cl.[3] **F16C** *33/00*
U.S. Cl. 308—218 **11 Claims**



1. A conical bearing cage (**10**) for a tapered bearing assembly (**12**) comprising: an integral member having a conical central axis and including; a large circular ring (**14**) having an inner circumferential surface (**16**) and an outer circumferential surface (**18**) connected by inner (**20**) and outer (**22**) faces, a small circular ring (**24**) having an inner circumferential surface (**26**) and an outer circumferential surface (**28**) connected by inner (**30**) and outer (**32**) faces, a plurality of circumferentially spaced bridges (**34**) interconnecting said rings (**14**, **24**), each of said bridges (**34**) having top (**36**) and bottom (**38**) surfaces interconnected by spaced sides, said sides of each of said bridges (**34**) having a tapered portion (**40**) extending inwardly from said top surface (**36**) thereof for defining lips (**42**) at the intersection of each side and associated top surface (**36**), characterized by a rib (**44**) on said top surface (**36**) of each bridge (**34**) extending between said rings (**14**, **24**).

4,288,130

FILING SYSTEMS AND OTHER COLLAPSIBLE STRUCTURAL UNITS

Robert J. Baldwin, London, England, assignor to H. Geoffrey Lynfield, Old Greenwich, Conn.

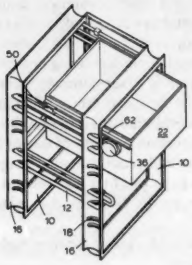
Filed Jan. 17, 1979, Ser. No. 4,246
Int. Cl.[3] **A47B** *63/00;* **A47F** *5/14;* **F16C** *21/00*
U.S. Cl. 312—183 **6 Claims**

1. A collapsible structural storage unit comprising in combination:

(1) a pair of profiled main frames;

(2) locking slots arranged in pairs along the vertical sides of the said main frames;

(3) at least two locking frames with multiple bars fitting tightly with a spring action into said locking slots and rigidly locking the main frames together; and



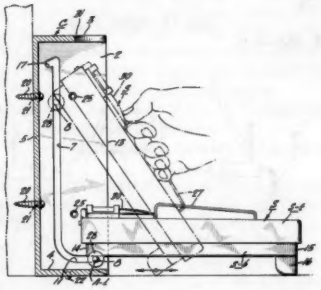
(4) drawers and like receptacles slidably supported by said locking frames which are also serving as drawer runners.

4,288,131

CABINET-MOUNTED BATHROOM-SCALE

William J. Griffin, 2531 Rosewood Ave., Roslyn, Pa. 19001

Filed Apr. 27, 1979, Ser. No. 34,124
Int. Cl.[3] **G01G** *19/52;* **A47F** *5/08*
U.S. Cl. 312—245 **6 Claims**



1. A cabinet-mounted bathroom-scale comprising

a bathroom scale;

a cabinet having a top wall and two generally vertical sidewalls having generally vertically disposed pivot-guiding grooves therein;

opposite pivots carried by the rear end of the bathroom-scale and extending into said grooves;

said grooves and said pivots being so arranged that when the rear end of the bathroom-scale is raised the pivots thereof will rise upwardly in the grooves and the front end of the bathroom-scale can be moved into the cabinet, and so that by lowering the pivots in said grooves the front end of the bathroom-scale will extend outwardly from the cabinet into its operative position; and

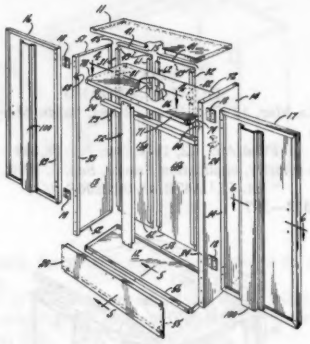
said top of the cabinet having a cutout in the front edge thereof for improving visibility of the bathroom-scale.

4,288,132

METAL CABINET FOR ASSEMBLY BY THE USER FROM KNOCKED-DOWN CONDITION

Henry Znamirowski, Ellicott City, and David J. Roles, Baltimore, both of Md., assignors to Roper Corporation, Kankakee, Ill.

Filed Feb. 19, 1980, Ser. No. 122,447
Int. Cl.³ A47B *43/00*; F16B *12/00*
U.S. Cl. 312—257 R **12 Claims**



1. In a rectangular metal cabinet construction the combination comprising top and bottom panels, side panels, and an extensive rear panel all having mated edges as well as a pair of front doors and intended for sale and transport in a knocked-down condition for assembly with self-tapping screws penetrating the mated edges, the rear panel having flanges along its lateral edges, the side panels having flanges along their front edges, the flanges being of the box type to impart torsional rigidity at the four upright corners of the cabinet and to receive as well as shield and conceal the tips of the self-tapping screws upon penetration thereof, a rectangular shelf in the cabinet dimensioned to extend to the walls thereof and having downwardly turned edges to define a thickness dimension, the box type flanges being notched out at the shelf level by an amount equal to the thickness dimension of the shelf to enable engagement between the edges of the shelf and the walls as well as support for the shelf in the vertical direction.

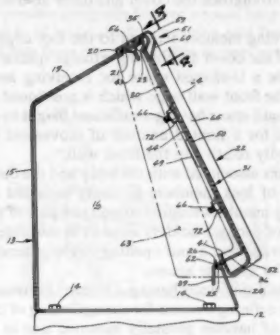
4,288,133

APPLIANCE CONTROL HOUSING AND CONSOLE CONSTRUCTION

Robert L. Deatherage, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Mar. 17, 1980, Ser. No. 130,836
Int. Cl.³ A47B *81/00*; B65D *6/00*
U.S. Cl. 312—279 **12 Claims**

1. A control panel assembly for an appliance control housing having an open front, the combination comprising: a relatively rigid support panel for generally closing said open front and including a front portion and rearwardly projecting upper and lower shoulder portions; a relatively less rigid decorative panel including a face portion having a generally coextensively overlying relationship with the front portion of said support panel and rearwardly projecting upper and lower flanges having an overlapping engagement with the shoulders of said support panel, the fabricated dimension between said support panel shoulder portions across the points of engagement with said decorative panel flanges being greater than the corresponding dimension between said decorative panel flanges to produce interference for removably retaining said decorative panel on said support panel and for springing apart said decorative panel flanges and bowing said decorative panel face portion into biased engagement with the front portion of said support panel; means associated with each of said panels and



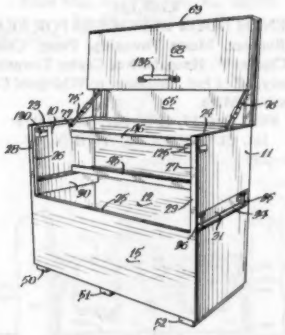
cooperable for locating said decorative panel upon and interlocking said decorative panel to said support panel.

4,288,134

STORAGE CABINET

Howard L. Knaack, and Kenneth F. Weger, Jr., both of Cary, Ill., assignors to Knaack Manufacturing Company, Crystal Lake, Ill.

Filed Aug. 21, 1980, Ser. No. 179,969
Int. Cl.³ A47B *81/00, 95/02*; E05B *67/38*
U.S. Cl. 312—290 **15 Claims**



1. A storage cabinet of sheet metal having a body with front, rear and side walls extending upwardly from a bottom to define a storage space,

said side walls having upper edges which lie in a plane parallel to said bottom and said front wall having a major part thereof with an upper edge positioned at a lower level than said plane to provide a front access opening,

a two-part cover for said cabinet hinged along the upper edge of said rear wall with one part of the cover of a width to span the upper edges of the side walls and having a section at a right angle to the major part thereof, the other part of the cover being hinged to said section along an edge thereof and having a width and length to coact with said section and cover said access opening when the cover is closed,

a cover restrictor connected between said cover parts to limit relative pivotal movement of said parts and movable to a position to permit said cover parts to lie in close generally parallel relation when the cover is open,

elongate reinforcing members secured to the underside of

the cover parts and positioned to lie immediately within the upper edges of the side walls and parts of the front wall extending upwardly at either side of the access opening to strengthen the cover and deter insertion of a prying tool,

a reinforcing member secured to the free edge of the other part of the cover and having a flange spaced therefrom to provide a U-shaped space for receiving and interfitting with the front wall edge which is positioned at said lower level, said space having a sufficient height to maintain said interfit for a limited amount of movement of the cover upwardly relative to the front wall,

lock means associated with the body and the cover including a pair of lock members pivotally mounted on said reinforcing members secured to said one part of the cover and a pair of padlock holders secured to said side walls within the storage space and opening to the exterior of the side walls for exterior access,

each of said side walls having a formed horizontally-extending rib defining a recess for strengthening of the side walls, a pair of handles pivotally mounted one in each of said recesses for movement between a storage position lying within the recess and behind the exterior faces of the side walls to operative positions extended outwardly of the recesses, a shelf within the storage space secured at its ends to said side walls and resting upon the side wall ribs,

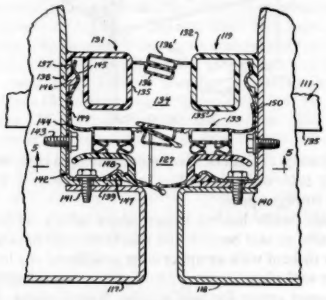
and skid members secured to the underside of said bottom each including a formed member with an interior chamber and a series of openings, and a pair of plates secured to the formed member within the chamber at opposite ends thereof and having holes in alignment with said openings for mounting of casters on the underside of said skid members.

4,288,135

FRENCH DOOR REFRIGERATOR SEAL

William J. Buchser, Marrs Township, Posey County; Ralph Tate, and Charles W. Haag, both of Center Township, Vanderburgh County, all of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 11, 1979, Ser. No. 83,974
Int. Cl.[3] E06B 7/16; A47B 96/00
U.S. Cl. 312—296 **24 Claims**



1. In a refrigeration apparatus having wall means defining a refrigerated space and having a front portion defining an access opening to said space, a pair of doors pivotally mounted in side-by-side relationship for selectively closing said access opening, and seal elements carried by portions of the doors which are juxtaposed when the doors are positioned to close said access opening outwardly of said wall means, said seal elements including outer portions cooperatively defining an outer seal and inner portions cooperatively defining an inner seal with an air space having upper and lower ends between said outer and inner seals when the doors are positioned to close said outer and inner seals when the doors are positioned to close said access opening, the improvement comprising:

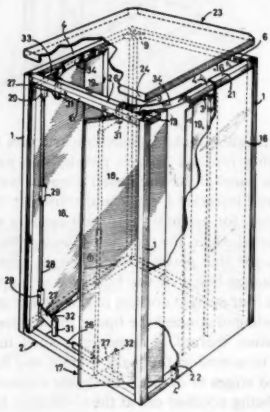
sealing closure means for closing said ends of said air space to define a dead air space between said doors outwardly of said wall means front portion when said doors are positioned to close said access opening.

4,288,136

METAL CUPBOARD

Gerard Le Mer, 12 Chemin du Milieu, 95540 Mery sur Oise, France

Filed Aug. 22, 1979, Ser. No. 68,649
Claims priority, application France, Sep. 5, 1978, 78 25474
Int. Cl.[3] A47B 43/00; E06B 9/14
U.S. Cl. 312—297 **4 Claims**



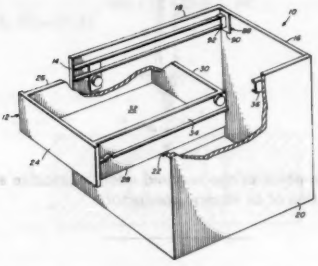
1. In a metal cupboard comprising a parallel-sided framework, the framework comprising an upper frame having a rectangular shape and comprising tubular members, a lower frame having a rectangular shape and comprising tubular members, four uprights constituted by tubular section members which are assembled at respective ends thereof with the upper and lower frames, at least two rectangular panels respectively closing at least two lateral sides of the framework, which sides are in opposed relation, and a sheet metal roof covering said upper frame; the improvement comprising an arrangement which is sufficient to maintain said at least two panels assembled with the framework and with the roof and comprises in combination first flange means rigid with a lower end portion of each of said at least two panels and downwardly bearing on a corresponding one of said tubular members of said lower frame, second flange means rigid with an upper end portion of each of said at least two panels and downwardly bearing on a corresponding one of said tubular members of said upper frame, and downwardly extending edge portions on said roof so that said roof constitutes a lid which closely caps said at least two panels and said downwardly extending edge portions overlap and engage said upper end portions of said at least two panels and trap said upper end portions between said downwardly extending edge portions and said corresponding ones of said tubular members of said upper frame and said roof overlaps and engages said second flange means and traps said second flange means between said roof and said corresponding ones of said tubular members of said upper frame.

4,288,137

DRAWER SLIDE SYSTEM

Paul M. MacDonald, Scituate, Mass., assignor to Dickran Babigian, West Newton, Mass.

Filed Feb. 19, 1980, Ser. No. 122,351
Int. Cl.³ A47B *88/04*; F16C *21/00*
U.S. Cl. 312—341 R **5 Claims**



1. A system for slidably mounting a drawer to a cabinet, comprising

(a) a pair of first members mountable to said cabinet one on each side thereof adjacent the path of travel of said drawer, and,

(b) a pair of second members mountable to said drawer one on each side thereof in generally opposite facing relation to said first members,

(c) each of said first members including an elongated first track of U-shaped transverse cross-section defining a channel of a length generally co-extensive with the depth of said cabinet, said first track mountable to said cabinet with said channel facing said drawer and a first roller mounted integral to said first track in predetermined spaced relation below said channel and near the forward end thereof, said first roller defining a gap with the lower portion of said channel,

(d) each of said second members including an elongated second track of an L-shaped transverse cross-section defining a generally flat back portion and a rail portion perpendicular thereto and longitudinally co-extensive therewith of a length generally corresponding with the depth of said drawer, said rail extending from the lower edge of said back portion, said second track mountable to the outer face of the side of said drawer with said back portion flat against said side and said rail extending outwardly from the lower long edge thereof and below the channel of said first track into said gap to rest on top of said first roller, and a second roller mounted integral to the flat back portion of said second track above said rail near the rearward end thereof and extending into cooperative engagement with said channel said first and second rollers being generally co-planar.

4,288,138

FUSE PULLER

Edgar L. Berry, and Joseph C. Drilling, both of Lexington, Ky., assignors to Square D Company, Palatine, Ill.

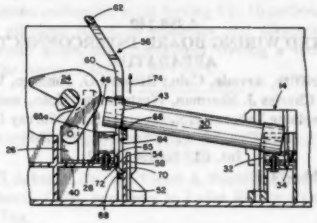
Filed Oct. 29, 1979, Ser. No. 89,001
Int. Cl.³ H01R *13/633*
U.S. Cl. 339—45 R **15 Claims**

1. A fusible switch assembly having a fuse puller for disengaging a fuse extending between a pair of spaced fuse clips secured to an insulating assembly, the improvement comprising:

said insulating assembly having portions defining a linear guideway adjacent one of said clips, said guideway extending transverse to the axis of said fuse and positioned intermediate the ends of said fuse and between said clips,

an integrally formed loop of insulating material encircling the axis of said fuse and having a handle portion adapted to be manually engaged and a second portion engaged in said guideway to guide the movement of said loop transverse to said axis,

a first wall portion integrally formed on said loop intermediate the ends of said loop for engaging said fuse to disengage said fuse from one of said clips in response to manual



engagement of said handle portion and movement of said loop along said guideway in one direction, and

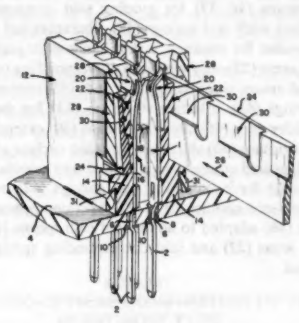
stop means integrally formed on said loop for engaging respective portions of said insulating assembly to define respective limit positions in the movement of said loop in said one direction and in a second direction opposite said one direction.

4,288,139

TRIFURCATED CARD EDGE TERMINAL

Robert F. Cobaugh, Elizabethtown; James E. Lynch, Harrisburg, and Attalee S. Taylor, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 6, 1979, Ser. No. 18,076
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—74 R **21 Claims**



1. In an elongated electrical terminal having a conductive first contact surface and a joined, resilient beam portion provided with a conductive second contact surface, with each of said contact surfaces being pivoted toward and into engagement with a conductive circuit member upon resilient pivotal deflection of said terminal in a first direction toward said circuit member, the improvement comprising:

said second contact surface being provided on a free end of said beam portion which initially projects outwardly beyond said first contact surface in said first direction,

said second contact surface initially engaging said circuit member in a first position prior to engagement thereof by said first contact surface, and

said beam portion being resiliently deflected by continued pivotal resilient deflection of said terminal in said first direction while said second contact surface engages said circuit member, so that said second contact surface is

caused to slidably traverse along said circuit member to a second position which is on said circuit member and which is in a plane common to said first contact surface and extending directly across a width of said terminal and normal to a tangent of said first contact surface with said circuit member.

4,288,140

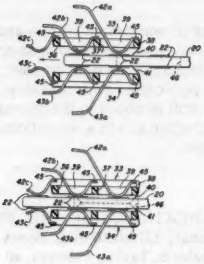
PRINTED WIRING BOARD INTERCONNECTION APPARATUS

Gary L. Griffith, Arvada, Colo.; Richard G. Johnsen, Wheaton, Ill., and Charles J. Sherman, Westminster, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1979, Ser. No. 105,494

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—74 R **10 Claims**



1. Electrical interconnection apparatus comprising an electrical component **(20)** having at least a row of contact areas **(22)** affixed to a flat surface thereof, a row of contact springs (e.g., **42**) corresponding to said row of contact areas **(22)**, and guide means **(16, 17)** for guiding said component **(20)** into association with said springs **(42)**, characterized in that means are provided for ensuring a simultaneous engagement of said contact areas **(22)** only with said corresponding contact springs **(42)**, said means comprising rider ends **(45)** terminating each of said springs **(42)**, a lattice structure **(33)** for supporting said spring rider ends **(45)**, and cam means **(40)** extending from said lattice structure **(33)** slidable along said surface of said component **(20)** as said component is guided into association with said springs **(42)** for maintaining said springs **(42)** out of engagement with said contact areas **(22)**, said component **(20)** having recesses **(46)** adapted to admit said cam means **(40)** when said contact areas **(22)** and said corresponding springs **(42)** are in alignment.

4,288,141

INSULATION DISPLACEMENT CONTACT FOR AN ELECTRICAL CONNECTOR

Russell A. Leather, Perth, Scotland, assignor to Ferranti Limited, Cheadle, England

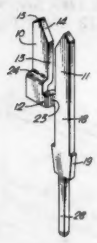
Filed Dec. 4, 1979, Ser. No. 100,107

Claims priority, application United Kingdom, Dec. 8, 1978, 47683/78

Int. Cl.³ H01R *11/20, 43/00*

U.S. Cl. 339—97 R **16 Claims**

1. An insulation-displacement contact for an electric connector which includes a terminal element for connection to an electric conductor and a contact-making element for connection to an electric circuit, the terminal element comprising two spaced arms joined together at one end by a link portion and together defining a parallel-sided notch, a first one of the arms being displaced relative to the other arm by a double bend formed in the link portion and being further displaced by a double bend formed in the said one arm to define, with the



other arm, a notch of the required width to receive and displace insulation of an electric conductor.

4,288,142

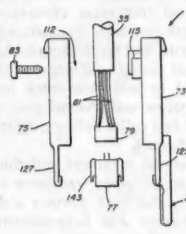
CABLE CONNECTOR

John J. Anderton, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 3, 1979, Ser. No. 81,601

Int. Cl.³ H01R *13/504*

U.S. Cl. 339—176 M **6 Claims**

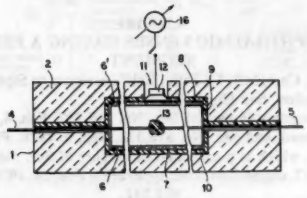


1. A connector having a plurality of terminals for interconnecting a plurality of conductors of a cable with a respective plurality of electrical contacts comprising an elongated insulating bottom body having opposing faces and a plurality of openings arranged along a pair of spaced parallel rows, a plurality of terminals being retained in respective openings, each terminal having a conductor receiving portion extending outwardly from one face and a contact engaging portion associated with the other face, an elongated top insulating body having a plurality of partitions adapted to hold a plurality of conductors in parallel spaced relation along a substantially common plane, a cover having a top opening for receipt of a cable therethrough and having means adapted to hold a cable extending through said top opening, a pair of opposing retaining flanges depending from said cover, said top body engaging said cover intermediate said flanges for preventing upward movement of said top body relative to said cover, said flanges have a plurality of slots, each slot having a lower edge portion, said bottom body includes projecting bosses matching said slots, each boss includes a lip portion, each lip portion overlaps a respective lower edge portion for holding said top and bottom bodies in assembled relationship interposed said flanges with the conductive receiving portions of respective contacts adapted to engage respective conductors of a cable, said bottom body and said flanges forming a pluggable portion with said contact engaging portions being adapted to mate with said respective electrical contacts.

4,288,143
METHOD OF AND APPARATUS FOR SPLICING OPTICAL FIBERS

Pietro Di Vita, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Dec. 27, 1979, Ser. No. 107,658
Claims priority, application Italy, Dec. 28, 1978, 69977 A/78
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.21 **19 Claims**

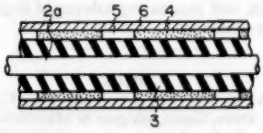


1. A method of splicing trunks of optical fibers, comprising the steps of:
- axially aligning a pair of fiber trunks to be spliced, with ends closely juxtaposed;
- clamping said fiber trunks at points spaced from their juxtaposed ends whereby said fiber trunks have unclamped extremities free to vibrate transversely;
- setting said extremities in joint vibration of limited amplitude and at frequencies higher than their natural frequency, with formation of standing-wave nodes adjacent their juxtaposed ends; and
- joining said juxtaposed ends together during their joint vibration.

4,288,144
OPTICAL FIBER SUBMARINE CABLE

Taiichiro Nakai, Fujisawa; Kahei Furusawa, Kamifukuoka; Makoto Nunokawa, Kawasaki, and Yoshihiro Ejiri, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Jan. 25, 1980, Ser. No. 115,331
Claims priority, application Japan, Jan. 26, 1979, 54/7043
Int. Cl.³ G02B *5/16*
U.S. Cl. 350—96.23 **7 Claims**



1. In an optical fiber submarine cable, the improvement comprising a high viscosity material of good wettability containing air gaps and filled in a space between an optical fiber cord having housed therein at least one coated optical fiber and a pressure resisting material layer having housed therein the optical fiber cord for protecting it from seawater pressure.

4,288,145
FIBER FOR OPTICAL COMMUNICATIONS

Tadashi Takeuchi, Higashikurume, and Taiji Yamabe, Yokohama, both of Japan, assignors to Daicel Ltd., Osaka, Japan

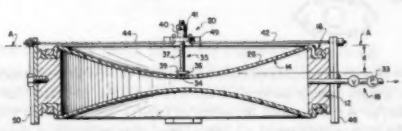
Filed Apr. 2, 1979, Ser. No. 25,950
Claims priority, application Japan, Apr. 10, 1978, 53-41975
Int. Cl.³ D02G *3/00*; G02B *5/14*
U.S. Cl. 350—96.34 **11 Claims**

1. A fiber for optical communication comprising a low-loss optical fiber core for optical communication, said core being covered with at least one coating layer of a polylaurolactam copolymer, said copolymer consisting essentially of 20 to 98 parts by weight of laurolactam and 80 to 2 parts by weight of one or more polyamide-forming monomers different from laurolactam, said polyamide-forming monomers being selected from the group consisting of lactams having 4 to 16 carbon atoms, amino carboxylic acids having 4 to 16 carbon atoms and salts of alkylene (C_4–C_{16}) diamines and alkylene (C_4–C_{16}) dicarboxylic acids, said copolymer having a melting point within the range of 100° C. to 170° C.

4,288,146
CURVED REFLECTOR WITH ADJUSTABLE FOCAL LENGTH

Alfred L. Johnson, Jr., and Victor A. Peckham, both of Manhattan Beach, Calif., assignors to LaJet Energy Company, Abilene, Tex.

Filed May 14, 1980, Ser. No. 149,587
Int. Cl.³ G02B *5/10*
U.S. Cl. 350—295 **18 Claims**



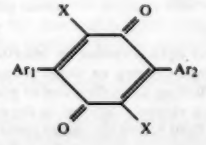
1. A reflector comprising:
- a hollow housing having an opening;
- a flexible, elastic reflective membrane;
- means for coupling said membrane over said opening in a gas-tight manner;
- evacuation means, coupled to said housing, for creating a partial vacuum in said housing tending to deflect said membrane below a reference plane and into said housing; and
- valve means, coupled to said housing, for controlling the depth of the deflection of said membrane,
- said valve means comprising
  - an aperture located in said membrane, and
  - a body mounted adjacent said aperture and having a flow restricting surface extending into said housing a depth equal to the depth of the desired deflection of said membrane relative to the reference plane and overlying said aperture.

4,288,147
ELECTRO-OPTICAL COMPOSITION OF THE GUEST-HOST TYPE

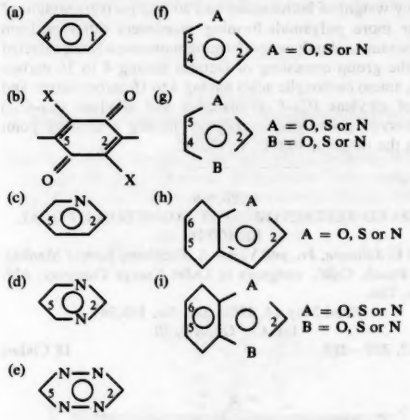
Gene C. Koch, Palo Alto, Calif., assignor to Timex Corporation, Waterbury, Conn.

Continuation-in-part of Ser. No. 971,625, Dec. 20, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,770
Int. Cl.³ G02F *1/13*; C09K *3/34*
U.S. Cl. 350—349 **16 Claims**

1. An electro-optical composition comprising a host liquid crystal admixed with a linear, noncondensed aromatic guest dichroic dye of the formula:



where Ar_1 and Ar_2 can be the same or a different mono or polycyclic aromatic radical selected from:



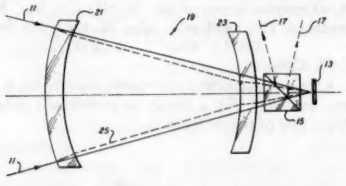
or (j) combinations of two or more of (a)–(i) joined together in a linear, noncondensed structure, with the proviso that when Ar_1 or Ar_2 comprise only one of (a)–(i), the radical is joined to the quinonoid ring at a 1 (para) type ring position in the case of (a) and at a 2 type ring position in the case of (b)–(i) and that when Ar_1 or Ar_2 comprise the combination of two or more of (a)–(i), radical (a) is linked to adjacent radicals at 1,4 type ring positions, radicals (b), (c), (d) and (e) are linked to adjacent radicals at 2,5 type ring positions and radicals (f) through (i), when present, are terminal radicals at the end of the dye molecule and are linked to adjacent (a), (b), (c), (d), or (e) radicals at a 2 ring position, and with the further proviso that the terminal radical of the dye molecule may include a generally linear, nonionic substituent at a 4 type terminal ring position in the case of (a), at a 5 type terminal ring position in the case of (b), (c), (d) and (e), at a 4 or 5 terminal ring positions in the case of (f) and (g) and at 5 or 6 terminal ring positions in the case of (h) and (i) and where X is a monovalent blocking substituent which is not fused to the adjacent aromatic radical so as to ensure the linear, noncondensed molecular structure.

4,288,148

BEAM-SPLITTING OPTICAL SYSTEM

Abe Offner, Darien, and David A. Markle, Norwalk, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 29, 1979, Ser. No. 70,568
Int. Cl.³ G02B *13/00, 27/18*
U.S. Cl. 350—453 **13 Claims**



1. A unit power optical system for insertion into projection apparatus to permit viewing an image projected on an image plane without affecting its quality, size or position comprising:

a beam splitting element disposed in the optical path of the converging light before the image plane so that said beam splitting element will transmit the radiation to the image plane and reflect a portion of the radiation reflected from the image plane in a direction which permits viewing;

means disposed in said optical path to correct for image displacement and aberrations caused by said beam splitting element; and

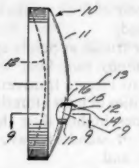
said optical system being afocal so that said system will remain at unit power when it is shifted longitudinally and the image position is insensitive to longitudinal displacement.

4,288,149

RESIN OPHTHALMIC LENSES HAVING A PRISMATIC SEGMENT

Charles D. Campbell, La Jolla, Calif., assignor to Signet Optical Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 765,537, Feb. 4, 1977, abandoned, and Ser. No. 876,323, Feb. 9, 1978, Pat. No. 4,163,541, which is a continuation-in-part of Ser. No. 765,536, Feb. 4, 1977, abandoned. This application Feb. 24, 1978, Ser. No. 881,131
Int. Cl.³ G02C *7/06*
U.S. Cl. 351—170 **4 Claims**



1. A cast resin ophthalmic lens comprising a homogeneous body defined of cured optical casting resin and having a cast optically finished front surface composed of a major surface portion and a minor surface portion, the minor surface portion defining in the front surface in a selected localized area thereof a lens segment having a predetermined prismatic optical effect, the major surface portion being a portion of an aspheric surface of revolution having a first axis of symmetry and having an effective center of curvature located therealong, the minor surface portion being a portion of a surface of revolution having a second axis of symmetry, the first and second axes of symmetry intersecting, if at all, at a location on the first axis other than at substantially the center of curvature of the major surface portion, said axes having substantial angularity therebetween if they intersect.

4,288,150

DIAPHRAGM CONTROL DEVICE FOR CAMERAS

Tokuji Ishida, Daito, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

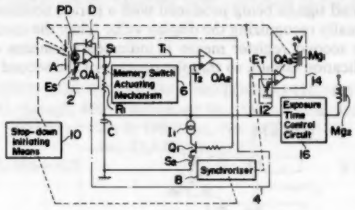
Filed Oct. 27, 1980, Ser. No. 201,312
Claims priority, application Japan, Oct. 26, 1979, 54/139182
Int. Cl.³ G03B *7/097*
U.S. Cl. 354—23 D **12 Claims**

1. A diaphragm control device for a camera which includes a diaphragm forming a diaphragm aperture and which is capable of a stopping-down operation and a means for initiating the stopping-down operation of said diaphragm, said control device comprising:

a light measuring circuit for generating a light measurement signal commensurate with the scene brightness measured through said diaphragm aperture, said light measurement signal including fluctuation components when timewise variations are involved in the scene brightness and which varies with the change in said diaphragm aperture due to the stopping-down operation of said diaphragm;

an approximate signal-generating circuit for generating, on the basis of said light measurement signal, an approximate

signal which varies approximately with the change in said diaphragm aperture due to the stopping-down operation of said diaphragm and which coincides with said light measurement signal when no fluctuation components are included in said light measurement signal;



means for generating a reference signal; and

stopping-down operation stopping means for stopping the stopping-down operation of said diaphragm when said approximate signal represents a given relationship with respect to said reference signal.

4,288,151

POWER SOURCE SWITCH FOR USE IN CAMERA CIRCUIT TO DETECT A FOCUSED CONDITION

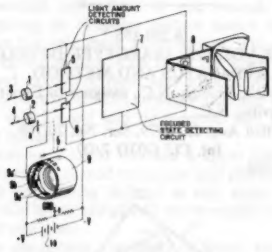
Seiichi Matsumoto, Yokohama; Hideo Yokota, Tokyo, and Mutsuhide Matsuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 774,116, Mar. 3, 1977, Pat. No. 4,142,788. This application Aug. 23, 1978, Ser. No. 936,590

Claims priority, application Japan, Mar. 12, 1976, 51/27583; Mar. 12, 1976, 51/27584; Jul. 30, 1976, 51/91094

Int. Cl.³ G03B *13/18, 17/20*

U.S. Cl. 354—25 **5 Claims**



1. A photographic camera comprising:

(a) a camera casing;

(b) a manually operated distance setting ring carried on said casing;

(c) light receiving means within said camera for producing an output in response to received light;

(d) a detecting circuit for detecting a focused condition in accordance with the output of said light receving means;

(e) display means for displaying existence of a focused condition in accordance with the output of the detecting circuit;

(f) a power source for energizing at least said detecting circuit;

(g) a normally open switch connected between the detecting circuit and said power source; and

(h) an operating member responsive to pressure exerted thereon to close said switch, said member being arranged on said distance setting ring at a point where an operator operates the ring in performing a distance setting operation.

4,288,152

AUTOMATIC RANGE FINDER SYSTEM

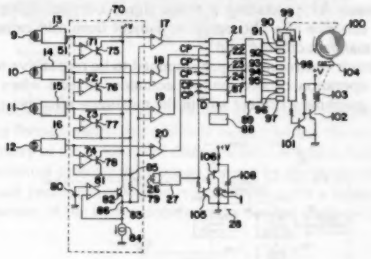
Motonobu Matsuda, Kawachinagano, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1980, Ser. No. 176,635

Claims priority, application Japan, Aug. 16, 1979, 54-104796; Aug. 16, 1979, 54-104797; Aug. 16, 1979, 54-104798

Int. Cl.³ G03B *7/08;* **G01J** *1/20*

U.S. Cl. 354—25 **36 Claims**



1. An automatic range finder for a camera comprising:

means for projecting a pulse of light beam toward an object;

means kept apart from said projecting means by a predetermined base length for focusing the light beam reflected back from the object, the optical axis of said focusing means being substantially parallel with the path of the projected light beam;

means arranged on the focal plane of said focusing means for receiving the reflected light beam focused by said focusing means, said receiving means including a plurality of photosensitive elements aligned along the direction of the base length;

means connected to said photosensitive elements for detecting the relatively rapid changes in the individual currents generated by said photosensitive elements respectively to produce corresponding current outputs;

means connected to said detecting means for converting said current outputs into corresponding changes in voltages if any of said relatively rapid changes in the currents is detected respectively;

means for generating reference voltage levels;

means for comparing each of said voltage changes from said converting means with each of said reference voltage levels respectively;

means for producing a distance signal in response to said comparing means; and

means for altering said reference voltage levels in response to said converting means by values determined by the greatest of said changes in voltages respectively.

4,288,153

AUTOMATIC STROBE CAMERA

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 28, 1979, Ser. No. 80,130

Int. Cl.³ G03B *7/087, 7/16, 15/05*

U.S. Cl. 354—27 **6 Claims**

1. A camera for use under conditions ranging from insignificant ambient scene light intensity to substantial scene light intensity, said camera comprising:

a housing having means for defining a focal plane;

a lens assembly for directing image forming light rays from a photographic scene along a given exposure path to said focal plane;

means for positioning a sheet of photographic film at said focal plane;

energizable means for evaluating scene light;

an electrically controlled shutter arrangement actuatable for

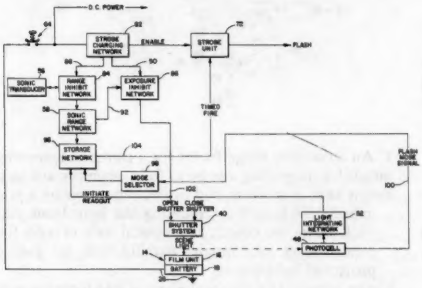
unblocking and blocking said exposure path to define an exposure interval, said shutter arrangement including means responsive to each actuation of said shutter arrangement for defining the same pattern of varying aperture values, including progressively enlarging aperture values, in operative relation to said exposure path in the absence of actuation of said shutter to terminate said exposure interval prior to said shutter arrangement defining its maximum achievable aperture value;

an electronic flash unit permanently affixed on said housing and having a predetermined maximum effective range;

means for producing a range signal corresponding to the distance of a photographic subject from said camera;

a manual actuator; and

circuit control means programmed to be responsive to every operation of said manual actuator, at least when photographing a subject within the maximum effective range of



said flash unit, for effecting the actuation of said shutter arrangement to initiate an exposure interval, for automatically firing said electronic flash unit during each said exposure interval at the instant an aperture value, correlated to said range signal and selected from said enlarging aperture values, is presented in operative relation to said exposure path by said shutter arrangement, and for then actuating said shutter arrangement to terminate said exposure interval in accordance with a predetermined film exposure being achieved,

whereby, whenever a photographic subject is within said maximum effective range of said flash unit during different exposure operations, said camera is preprogrammed to automatically provide photographic exposures embodying range dependent, aperture controlled amounts of flash illumination responsive to all normally intended actuations of said manual actuator regardless of the levels of ambient scene light present.

4,288,154

DIGITAL INFORMATION INDICATING SYSTEM

Nobuaki Sakurada, Kanagawa; Nobuhiko Shinoda; Yukio Mashimo, both of Tokyo; Tadashi Ito, and Fumio Ito, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 850,806, Nov. 11, 1977, abandoned, which is a continuation of Ser. No. 610,276, Sep. 4, 1975, abandoned. This application May 2, 1979, Ser. No. 35,211

Claims priority, application Japan, Sep. 4, 1974, 49/101710

Int. Cl.³ G03B *17/18*; G01J *1/44*

U.S. Cl. 354—23 D **11 Claims**

1. A device for indicating photographic exposure information in digital form, comprising:

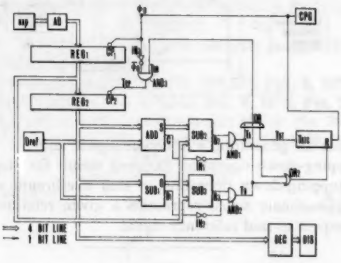
(a) a conversion means for converting analog exposure information corresponding to an object brightness into a digital value;

(b) a first register means to read out and memorize the output of said brightness information converting means;

(c) a second register means coupled to said first register means, said second register means for memorizing the content of the first register means;

(d) an indication circuit to provide an indication corresponding to the content of the second register means;

(e) a transmit signal forming circuit for generating periodically a signal for transmitting content of the first register means to the second register means, the periodically generated signals being produced with a period necessary for visually recognizing the display value when the content of the second register means is indicated by means of the indication circuit, so that the content of the second register means is renewed periodically into a value corresponding to the brightness; and



(f) a control circuit connected to the first register means and the second register means, which forms a signal for transmitting the content of the first register means to the second register means independently of the transmit signal formed by the transmit signal forming circuit when the difference between the contents of the first and second register means exceeds a prescribed value, whereby the content of the second register means is renewed immediately when the brightness of the object changes sharply with the formation of the transmit signal.

4,288,155

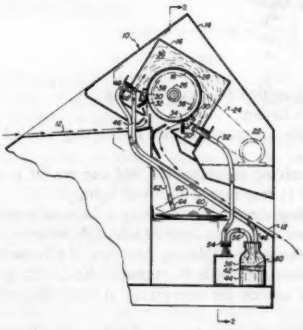
VARIABLE VOLUME DIAZOTYPE DEVELOPING APPARATUS AND METHOD

Henry W. Patrick, Raleigh, N.C., assignor to Diazit Company, Inc., Youngsville, N.C.

Filed Aug. 29, 1979, Ser. No. 70,795

Int. Cl.³ G03D *7/00*

U.S. Cl. 354—300 **11 Claims**



1. In a diazotype developing apparatus in which a gaseous developing medium of predetermined concentration is supplied to a containing system within which the gaseous developing medium is to be isolated from the surrounding ambient atmosphere, the containing system including a developing chamber, the improvement comprising variable volume means

for enabling the volume of the containing system to be varied with only negligible changes in the pressure within the containing system so as to allow the volume of gaseous developing medium of predetermined concentration to be maintained within the containing system at essentially the same pressure as the pressure of the surrounding ambient atmosphere during variations in the volume of gaseous developing medium within the containing system resulting from operation of the apparatus.

4,288,156

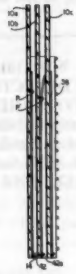
CARRIER FOR SHEET OF PHOTOGRAPHIC PAPER

David H. Savage, 4806 Castlewood Dr., Lilburn, Ga. 30247

Filed Feb. 4, 1980, Ser. No. 118,567

Int. Cl.³ G03D *13/12*

U.S. Cl. 354—312 **8 Claims**



1. Apparatus for simultaneous processing of a plurality of sheets of material, said apparatus comprising:

a plurality of carriers each comprising a generally rectangular plate having a face, a back and a lower edge, said face having a smooth surface for receiving said sheet, said smooth surface being sufficiently smooth that said sheet, when wetted, will adhere to said smooth surface, said back having an irregular surface which is sufficiently irregular that said sheet, when wetted, will not adhere to said irregular surface, a lip along the lower edge of said plate and extending from said smooth surface, said lip being so constructed and arranged that said sheet is urged against said lip and said lip supports said sheet on said smooth surface;

a sleeve having a lower end and a upper end, said sleeve being sized and shaped to receive said plurality of carriers through an opening defined in said upper end of said sleeve, said lower end of said sleeve supporting said lower edge of said plate;

a tank for containing a quantity of liquid, said tank being sized and shaped to receive said sleeve therein; and

said lower end of said sleeve defining at least one opening, whereby said liquid in said tank is communicable with said sheet on said smooth surface when said sleeve is received in said tank.

4,288,157

APPARATUS FOR CONTROLLING THE QUALITY OF A PICTURE WHICH IS TO BE PROCESSED IN A REPRAPPARATUS

Felix Brunner, Corippo, Switzerland

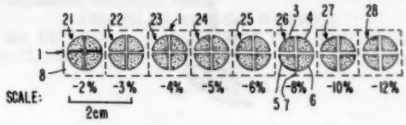
Continuation of Ser. No. 756,562, Jan. 3, 1977, abandoned, which is a continuation of Ser. No. 447,621, Mar. 4, 1974, abandoned. This application Mar. 20, 1979, Ser. No. 22,243

Claims priority, application Switzerland, Mar. 8, 1973, 3437/73

Int. Cl.³ G03B *27/52, 27/32*

U.S. Cl. 355—40 **21 Claims**

1. An apparatus for use in checking the quality of a screened print, consisting of screen dots, which occupies a predetermined area of a carrier member, said apparatus comprising at least one measurement element which is applied to the carrier member outside said predetermined area, said measurement element including at least one measurement symbol which is of substantially the same overall shape as one of the screen dots forming the screened print and the size of which is of the same order of magnitude as the size of one of the screen dots forming



the screened print, said symbol having an external periphery and being formed with a gap which is located within the external periphery of the symbol and disappearance of which during reproduction of printing of an image formed by the screen dots within said predetermined area represents directly a measure of a departure of the screen dots from the desired shape or size thereof.

4,288,158

LASER CEILOMETER WITH SAFETY POWER-REDUCTION FEATURE

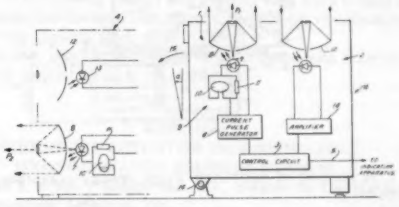
Frank Früngel, Herwigredder 105a, 2000 Hamburg 56, Fed. Rep. of Germany

Filed Mar. 28, 1979, Ser. No. 24,779

Claims priority, application Switzerland, Mar. 31, 1978, 3468/78

Int. Cl.³ G01C *3/08;* G08B *21/00*

U.S. Cl. 356—4 **14 Claims**



1. An improvement in a laser ceilometer, for use in a laser ceilometer which can be vertically oriented, which can be tilted away from a vertical orientation, and which emits laser radiation, comprising a means responsive to orientation of the laser ceilometer and cooperating therewith in such a manner as to cause the laser ceilometer to emit a maximum effective radiant power of laser radiation when the laser ceilometer is vertically oriented, and to cause the laser ceilometer to emit a less-than-maximum effective radiant power when the laser ceilometer is tilted away from a vertical orientation.

4,288,159

OPTICAL TEMPERATURE TRANSDUCER

David P. Newman, Yellow Springs, Ohio, assignor to The Yellow Springs Instrument Company, Inc., Yellow Springs, Ohio

Filed Oct. 1, 1979, Ser. No. 80,759

Int. Cl.³ G01J *5/48;* G01K *11/14*

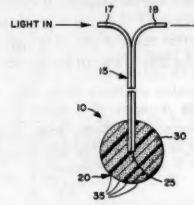
U.S. Cl. 356—44 **20 Claims**

1. An optical temperature transducer, comprising:

(a) fiber optical light conducting means having a terminal end,

(b) a substantially solid temperature-dependent light absorbing matrix mass optically coupled on said terminal end of said fiber optical light conducting means, and

(c) said matrix mass including multifaceted randomly oriented and distributed reflecting chips therein for randomly distributiung light therein received from said fiber



optical light conducting means and returning a portion of the unabsorbed light therethrough, reflection of light by said chips being substantially unaffected by temperature.

4,288,160

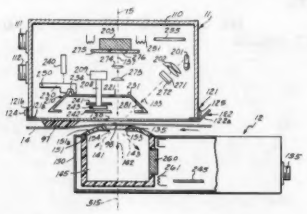
OPTICAL PROPERTY MEASUREMENT SYSTEM AND METHOD

Fred P. Lodzinski, Port Edwards, Wis., assignor to Nekoosa Papers Inc., Port Edwards, Wis.

Continuation-in-part of Ser. No. 429,637, Dec. 28, 1973, abandoned, and a continuation-in-part of Ser. No. 540,251, Jan. 10, 1975, Pat. No. 4,019,819. This application Jan. 24, 1975, Ser. No. 543,902

Int. Cl.[3] G01N *21/17, 21/86*

U.S. Cl. 356—73 **4 Claims**



1. A method of measuring Tappi opacity comprising the steps of:

(a) calibrating a transmittance measurement (TSP6) to obtain a calibrated transmittance value (TPD/TD) which is a measure of the transmittance of light having a spectral distribution for characterizing Tappi opacity,

(b) separately calibrating a reflectance measurement (RSP6) to obtain a calibrated reflectance value (RPD6) which is a measure of the reflectance of light having a spectral distribution for characterizing Tappi opacity,

(c) calculating a transmittance value (T) based on the calibrated transmittance value (TPD/TD) and the calibrated reflectance value (RPD6) such that the calculated transmittance value (T) corresponds to the absolute transmittance as measured on a scale from zero to one hundred,

(d) calculating a reflectance value (R_o) based on the calibrated reflectance value (RPD6) and the calibrated transmittance value (TPD/TD) such that the calculated reflectance value (R_o) corresponds to the absolute reflectance as measured on a scale from zero to one hundred, and

(e) calculating a value for Tappi opacity ($R_o/R.89$) based both on said calculated transmittance value (T) and on said calculated reflectance value (R_o) utilizing a nonlinear mathematical relationship between Tappi opacity and the absolute transmittance and absolute reflectance values,

(f) arranging a light source on one side of a moving web of paper sheet material,

(g) directing light from the light source along a common incident light path so as to impinge on said one side of said moving web, and so as to provide wavelengths of light incident on the moving web having a spectral distribution for characterizing Tappi opacity,

(h) arranging transmitted light and reflected light detectors on the respective opposite sides of the moving web to receive light of said spectral distribution from the light source after passage along said common incident light path and respectively after being transmitted through said moving web and respectively after being reflected from said one side of said moving web, thereby to obtain from a common region of the moving web a transmittance signal from the transmitted light detector and a reflectance signal from the reflected light detector, and

(i) separately transmitting the transmittance and reflectance signals to provide a transmittance measurement (TSP6) and a reflectance measurement (RSP6) and separately converting said measurements to digital form for processing at least according to the foregoing steps (a) through (e).

4,288,161

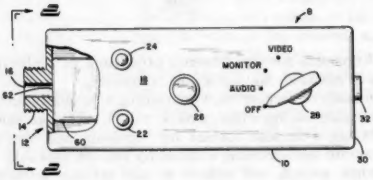
OPTICAL PROBE FOR DETECTING TRANSITORY AND REPETITIVE LIGHT SIGNALS

George H. Fortescue, Granada Hills, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Jun. 4, 1979, Ser. No. 44,989

Int. Cl.[3] G01J *1/44*

U.S. Cl. 356—73 **10 Claims**



1. A device for detecting transitory and repetitive light signals comprising:

detector means for detecting said light signals and for providing output signals indicative of the presence thereof;

first indicator means coupled to said detector means for providing a continuous indication of the initial presence of said light signals; and

second indicator means coupled to said detector means for providing an indication of the repetition rate of said light signals.

4,288,162

MEASURING PARTICLE SIZE DISTRIBUTION

Yoshiyasu Sakamoto; Yoichi Tamura; Kiyohiko Kawaguchi, and Kiyotaka Inada, all of Amagasaki, Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1979, Ser. No. 15,871

Int. Cl.[3] G01N *15/02*

U.S. Cl. 356—335 **6 Claims**

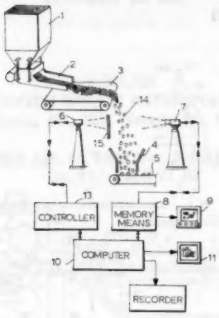
1. A method of determining particle size distribution of particles in a mass of a granular substance, comprising:

causing the mass of the granular substance to fall in a stream of separate particles through a predetermined distance;

producing a static image of the projected areas of the falling particles of the granular substance by providing a light transmitting screen along one side of the falling stream of particles, intermittently lighting said screen for brief periods of time for producing images of the particles in the stream of particles when the screen is viewed from a position laterally of the stream, the periods of the illumination being sufficiently brief to cause the images to appear

to be motionless, and televising the images of the particles at at least one period of lighting of the screen, and

measuring the projected areas of the images by utilizing the video signal of the televised instantaneous image of the falling stream of particles as the source of information of



the number of particles and the areas of the respective particles, the images of which have been televised; and, from the projected areas and assuming the average shape of the particles to be substantially a rotational ellipsoid, calculating the sizes of the individual particles and the distribution of the sizes of the particles in the mass.

4,288,163

LASERS ANGULAR RATE SENSOR

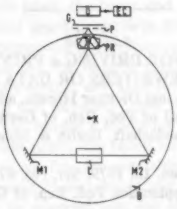
Ian G. Cassels, Dundee, Scotland, assignor to Ferranti Limited

Filed Sep. 25, 1979, Ser. No. 78,814

Claims priority, application United Kingdom, Sep. 27, 1978, 38274/78

Int. Cl.³ G01C *19/64*

U.S. Cl. 356—350 **8 Claims**



1. A ring laser which includes a laser active medium, two or more optical energy reflecting devices and a partially-reflecting device arranged around a closed path such that laser energy generated in the active medium circulates as two counter-rotating beams around the closed path, the partially-reflecting device being arranged to divert a small part of the energy in each beam out of the closed path, an optical energy reflecting element located so as to direct the diverted parts of both of the counter-rotating beams of energy towards one another to produce an interference pattern in a plane outside the closed path, and of such form that the diverted parts of the counter-rotating beams of energy intersect with one another in the same sense as that in which the counter-rotating beams strike the partially-reflecting device, an optical grating located in a plane adjacent to and parallel to that of the interference pattern and comprising a series of parallel lines spaced from one another at a pitch equal to or slightly different from that of the interference pattern, and a detector arranged to detect the presence and movement of any Moire fringe pattern set up by the relative movement of the interference pattern and the optical grating.

4,288,164

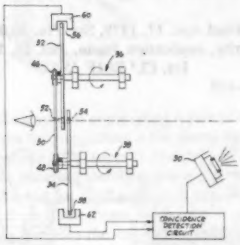
METHOD AND APPARATUS FOR VIEWING GLOWING OBJECTS

James M. Toth, Lyndhurst, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Jul. 19, 1979, Ser. No. 59,025

Int. Cl.³ G01N *21/55, 21/88;* B07C *5/342;* G05D *25/00*

U.S. Cl. 356—445 **23 Claims**



1. A method of determining surface characteristics of a quantity of steel during an intermediate stage in the manufacture of a finished steel product wherein the quantity of steel is in a hot, glowing, solid state comprising:

(a) illuminating the quantity of glowing steel with a source of bright light to create differentiating shadows so that surface indentations may be viewed and identified;

(b) determining surface characteristics of the quantity of steel by viewing the hot and glowing steel from behind a protective device which permits intermittent visualization of the glowing steel; and

(c) further processing the steel in accordance with information derived by such determination.

4,288,165

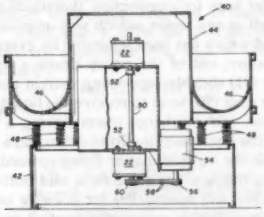
VIBRATORY ACTUATOR INCORPORATING HYDRODYNAMIC JOURNAL BEARING

Kenneth J. Fewel, Nacogdoches, Tex., assignor to The Hutson Corporation, Arlington, Tex.

Filed Aug. 15, 1979, Ser. No. 66,672

Int. Cl.³ B01F *11/00*

U.S. Cl. 366—124 **22 Claims**



1. A vibratory actuator, comprising:

a housing with an inner bearing surface of full cylindrical configuration;

eccentric means rotatably supported in said housing for generating vibration responsive to rotation thereof;

said eccentric means including an outer journal surface of partial cylindrical configuration extending in spaced apart relationship with the bearing surface of said housing to form a fluid film gap therebetween; and

fluid means disposed in said housing for hydrodynamically supporting said eccentric means during rotation within said housing.

4,288,166

APPARATUS FOR PRODUCTION OF STABLE SLURRY OF MILLED COAL AND A HYDROCARBON OIL

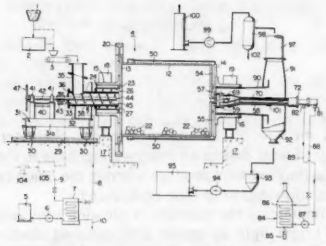
Yasuyuki Nakabayashi, Yokohama; Yoshio Matsuura, Funabashi; Masashi Hatano, Yono; Tatsuo Hagiwara, Funabashi; Masaaki Mikamo; Yoshimasa Ebihara, both of Chiba; Yasutomo Tomura, Narita, and Keiji Imai, Tonemachi, all of Japan, assignors to Electric Power Development Co. Ltd., Tokyo and Kawasaki Jukogyo Kabushiki Kaisha, Kobe, both of, Japan

Filed Apr. 17, 1979, Ser. No. 30,868

Claims priority, application Japan, Jun. 16, 1978, 53-72176

Int. Cl.³ B01F *15/06*

U.S. Cl. 366—149 **7 Claims**



1. An apparatus for producing a liquid mixture of a coal and a hydrocarbon oil comprising: a ball mill (4) including a substantially horizontal rotary drum having a horizontal axis and inlet and outlet end covers (13,14), said rotary drum having inlet and outlet bosses (15, 16) of cylindrical shape respectively fixed with mutually coaxial alignment to said inlet and outlet end covers and extending axially outwardly of the drum; heat applying means (50) disposed around and secured to the outer surface of the drum; bearing means (18, 19) for rotatably supporting said bosses; means (44, 45, 38) for supplying through said inlet boss (15) into the rotary drum the coal which previously has been coarsely crushed and the hydrocarbon oil; means (7) for preheating the hydrocarbon oil prior to its being thus supplied into the rotary drum; means (20) for rotating the rotary drum to mill, agitate, and mix therewithin the coal and the oil thereby to form a liquid mixture; a discharge duct (90) fixedly connected to said outlet boss (16) so as to be rotatable with the outlet boss for conducting therethrough the liquid mixture as well as any water, which was originally contained in the coal and which has been separated by evaporation from the liquid mixture, out of the rotary drum; a stationary discharge tower (91) slidably supporting therein the free end of said discharge duct (90) so as to receive the liquid mixture and water thereinto, said discharge tower having a bottom part (92) to which the liquid mixture flows down and a top part (97) through which the volatile matter flows upward; means (94) for conducting the liquid mixture from said bottom part to a storage tank (95); and means (99) for drawing out the water from said top part, further comprising heating medium supply and discharge pipe means (58, 70) extending longitudinally through said discharge duct (90) and said discharge tower (91) and having one end connected to said heat applying means (50) and the other end disposed outside said discharge tower for supplying and discharging a heating medium to and from the heat applying means (50), said supply and discharge pipe means being rigidly connected to the rotary drum and rotatable therewith; and a rotary joint (72) connecting said pipe means to heating means (84, 87) for heating and circulating the heating medium.

4,288,167

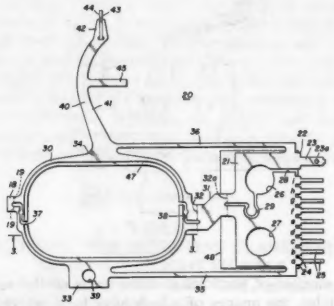
PRINTHEAD AND BLADES THEREFOR

Andrew B. Carson, Jr., Waynesboro, and Frederick M. Blodgett, Jr., Stuarts Draft, both of Va., assignors to General Electric Company, Waynesboro, Va.

Filed Feb. 13, 1980, Ser. No. 121,132

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—121 **20 Claims**



1. In a flat printing blade of the type having a flat generally annular rim in which is retained a flat-spiral substantially planar coil energizable for interaction with an associated magnetic field to effect movement of the rim in a predetermined direction parallel to the plane of the coil, a mounting portion spaced from the rim and substantially parallel to the plane of the coil, and a pair of resilient mounting arms spaced apart in the predetermined direction and extending from the mounting portion to opposed points on the rim, the improvement comprising:

an elongated arcuate printing arm extending from the rib generally in the predetermined direction and terminating in a printing tip, and

an elongated stabilizing member extending from the concave side of said printing arm intermediate the ends thereof substantially parallel to the plane of the coil.

4,288,168

ARRANGEMENT FOR DRIVING A PRINTER CARRIAGE IN TELETYPEWRITERS OR DATA PRINTERS

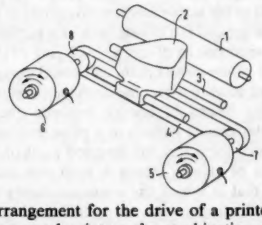
Ulrich Mayr, Germering; Dietmar Höreth, and Hans Kusmierz, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 12, 1979, Ser. No. 47,767

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1978, 2825761

Int. Cl.³ B41J *19/30*

U.S. Cl. 400—322 **9 Claims**



1. In an arrangement for the drive of a printer carriage in teletypewriters or teleprinters, the combination of a platen for supporting a recording medium, a printer carriage disposed for movement relative to the platen and carrying a printing head, a pair of drive motors of identical design, each disposed adjacent opposite sides of the carriage in the direction of travel

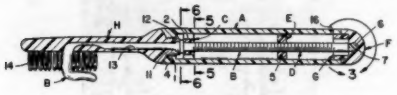
thereof, and pliable drawing means operatively connecting said carriage and said motors, whereby said motors are always simultaneously driven by means of identical control signals during the transport of said carriage and head on said pliable drawing means.

4,288,169

FOUNTAIN TOOTH BRUSH WITH SNAP-ON CLOSURE

Hugh McMenamin, IV, 2532 Nevada St., Union City, Calif. 94587

Filed Apr. 15, 1980, Ser. No. 140,576
Int. Cl.³ A46B *11/02*
U.S. Cl. 401—175 **1 Claim**



1. A fountain tooth brush comprising:

(a) a hollow barrel for holding toothpaste and having at a rear end thereof a fixed sleeve with an outer end projecting beyond the rear end of said barrel and being provided with an annular groove, the front end of said barrel having a threaded outlet opening;

(b) a screw shaft receivable in said barrel and a spider mounted in said barrel and having a bore for rotatably receiving an unthreaded portion of said screw shaft, said spider being spaced a short distance from said barrel outlet opening and said screw shaft having a flanged head contacting said spider on the side thereof adjacent the outlet opening of said barrel;

(c) a brush head with a threaded end removably receivable in said barrel outlet and having a toothpaste conveying passage leading from its threaded end to the bristle portion of said brush head, the inner end of said threaded end having spaced apart projections for extending into said barrel and contacting the adjacent end of said screw shaft head for spacing the flanged shaft end from the barrel outlet and preventing any axial movement of said screw shaft toward said threaded outlet of said barrel;

(d) a snap-on cap having a recess for receiving the exposed portion of said sleeve, the recess having a cylindrical wall of limited flexibility for rotatably receiving the outer cylindrical wall of said sleeve and having an annular rib adapted to be snapped into the annular groove in said sleeve;

(e) said shaft having a length to dispose the end of said screw shaft opposite to said head end projecting beyond the outer end of said sleeve being rounded with an indentation adjacent thereto and having flattened parallel side faces and a rounded end, said snap-on cap having said recess formed with an inner depression shaped similar to the screw shaft end which projects beyond said sleeve for operatively receiving this shaft end when said cap is snapped onto said sleeve so that rotation of said cap will rotate said screw shaft, the projections on the threaded end of said brush head contacting said screw shaft head for retaining said screw shaft against moving inwardly into said barrel when said cap is forced against said shaft end thus opposing the force required to snap the cap onto the adjacent end of said screw shaft and onto the sleeve; and

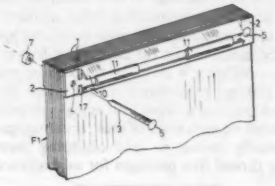
(f) a piston slidably received in said barrel and having a threaded bore for receiving said screw shaft so that rotation of said cap moves said piston through said barrel.

4,288,170

FILE BINDING SYSTEM

Donald T. Barber, Willowdale, Canada, assignor to Datafile Limited, Willowdale, Canada

Filed Aug. 31, 1979, Ser. No. 71,531
Int. Cl.³ B42F *13/36*
U.S. Cl. 402—17 **5 Claims**



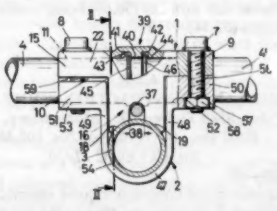
1. A file binding system comprising a pair of elongated rigid support members for supporting a file along its edge, securing members for securing the support members in a binding position, each of the securing members being provided with securing portions adapted for fitting through and securing the support members from their outer sides to provide an effective clamp of the file between the support members, and adjustable extension members along the outer sides of said rigid support members, said rigid support members being separable from one another when removed from the binding position and said securing members being independent of said rigid support members other than in the binding position to facilitate binding adjustment, each of said extension members being two-tiered in construction and comprising a lower hollow tier and an upper tier section raised and extended relative to the lower tier, the lower tiers of said extension members being slidable within the support members which are shaped to cooperate with the lower tiers and which are undercut to secure the lower tiers therein, the upper tiers of said extension members being adapted to override the securing portions of the securing members, each of which is made of resilient material with said securing portions being folded beneath the hollowed triangular tiers of extension members, the resiliency of each securing member driving said securing portions to a locking engagement with said extension members, said extension members being retractable inwardly of the securing portions of the securing members to gain access to said securing portions.

4,288,171

MOUNT FOR A HOLDING STRUCTURE OF A FREE-CUTTING DEVICE

Joachim Kottke, Remseck, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Mar. 1, 1978, Ser. No. 882,434
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 7706436[U]
Int. Cl.³ F16B *7/00*
U.S. Cl. 403—218 **23 Claims**



1. A mount for a single holding structure of a free cutting device, comprising: only first and second clamping members which respectively are each provided with openings and

depression-forming means and with cooperating clamping surfaces, a bearing or handle supporting tube member of the holding structure received between said first and second clamping members, at least one clamping member being provided with spacers and a receiving space located transverse to the depression-forming means and adapted to clampingly receive said supporting tube member of the free cutting device, screws guided in the openings of said clamping members and adapted to clamp said supporting tube member therewith between said clamping members, said receiving space for the supporting tube member and the depression-forming means at least partially confining a passage for said supporting tube member, said passage extending over the entire length of said clamping members, and at least four screws provided in pairs which are located on both sides of said receiving space and said depression-forming means in said clamping members, said passages being thread free passages for said screws.

4,288,172

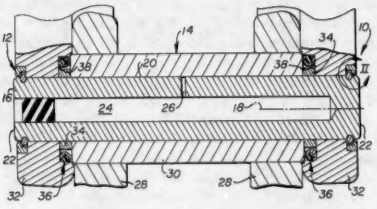
KEEPER ASSEMBLY

Richard E. Livesay, and Paul L. Wright, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 889,702, Mar. 24, 1978, Pat. No. 4,182,578. This application Feb. 21, 1979, Ser. No. 12,994

Int. Cl.³ F16B *21/16*

U.S. Cl. 403—317 **4 Claims**



1. In a keeper assembly **(10)** of the type including a first member **(16)** having a central axis **(18)** and an annular groove **(64)**, and a second member **(32)** having a force transmitting surface **(76)** located in a plane transverse to the axis **(18)**, the improvement comprising:

said groove **(64)** having a pair of planar side walls **(66,68)** and a concave root **(70)** defining a preselected U-shaped configuration in cross section as taken by a cutting plane through the axis **(18)**; and

a plurality of similar arcuate keeper segments **(46)**, each keeper segment **(46)** having a pair of planar side surfaces **(56,68)** and a convex curved surface **(60)** defining a preselected U-shaped configuration in cross section generally corresponding to the cross section of said groove **(64)**, each keeper segment **(46)** being seated in said groove **(64)** and in use transferring force from the surface **(76)** of the second member **(32)** into the first member **(16)**, and each keeper segment **(46)** having a radially outer cylindrical surface portion **(50)** having opposite edges **(52,54)**, each of said planar side surfaces **(56,68)** being connected to one of said edges **(52,54)**.

4,288,173

EXPANSION AND CONTRACTION JOINT ASSEMBLY

Albert T. Nick, 3545 Flowers Dr., Montgomery, Ala. 36109

Filed Dec. 19, 1979, Ser. No. 105,466

Int. Cl.³ E01C *11/10*

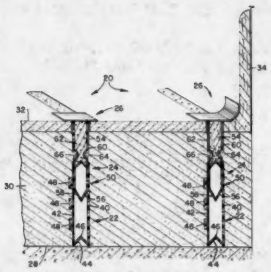
U.S. Cl. 404—49 **2 Claims**

1. An expansion and contraction joint assembly positionable between spaced floor tiles, the tiles being placed in a setting bed which is supported by a slab base, said joint assembly comprising:

a base component, said base component being an elongated channel having a hollow interior, spaced side walls, and a connecting bottom, at least one of said side walls having external locking ridges extending along said channel, bottom portions of said side walls contacting the slab;

an upper component in the form of a rectangular channel having a wedge shaped lower part telescopingly positionable in said hollow interior of said base component, side walls provided with lock slots, and an open upper chamber;

a cap component having downwardly extending legs and a detachable tab extending between said legs, said legs



having locking indents which cooperate with said lock slots to secure said cap component to said upper component; and

a resilient core positionable in said upper chamber of said upper component, said joint assembly being positionable between adjacent ones of the floor tiles with an upper surface of said core being adjacent an upper surface of the floor tiles, said joint assembly being adapted to compensate for expansion and contraction of said slab, setting bed, and floor tiles.

4,288,174

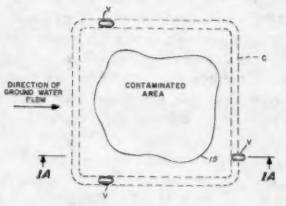
SYSTEM FOR GROUNDWATER FLOW CONTROL

Awbrey C. Laws, West Tisbury, Mass. 02175

Filed Sep. 10, 1979, Ser. No. 74,168

Int. Cl.³ E02B *11/00*

U.S. Cl. 405—43 **5 Claims**



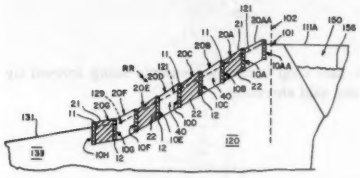
1. A system for virtually stopping the horizontal rate of groundwater flowing through and above a land mass, said system comprising means defining a plurality of adjacent approximately vertical well defining means located substantially along the circumference of the land mass and penetrating earth from a point at or below ground surface to a point at which substantial quantities of groundwater can be collected, said adjacent well means being connected to each other by conduits at connecting locations along said means forming at least 180 degrees of continuous conduit arc around said land mass, the connecting locations being approximately one foot to twenty feet below the upper level of said groundwater, said system functioning to virtually stop the horizontal flow rate of groundwater through said land mass and to virtually stop the rate of groundwater flow in subsurface land located in the region defined by the conduit arc and the groundwater level.

4,288,175

RETICULATELY REINFORCED EARTHEN DAMS AND METHOD FOR PROVIDING REINFORCEMENT

Leroy E. Baker, and Barry L. Butterfield, both of Omaha, Nebr., assignors to Henningson, Durham & Richardson, Inc., Omaha, Nebr.

Filed Oct. 29, 1979, Ser. No. 89,024
Int. Cl.³ E02B 7/06
U.S. Cl. 405—117 **20 Claims**



1. In an earthen dam comprising a lofty crest located immediately forwardly a water reservoir and including a crest-top transversely extending along a dam-axis, a downstream side including a substantially planar downstream-face sloping longitudinally forwardly and downwardly from said crest-top and having a transversely extending finite-extent defined by downstream-face gutters, and a dam toe portion including a toe-surface at the natural terrain, the improvement of reticulate dam reinforcement commencing at the crest-top and extending longitudinally downwardly therefrom and also extending generally parallel thereto for at least said finite-extent, said reinforcement being indefinitely thereafter capable of preventing breach of the earthen dam during overtopping by water flood flows and comprising:

A. a plurality of transversely extending and longitudinally separated upright check-walls and each check-wall including:

i. opposed transversely extending upright rear-surface and front-surface,

ii. a transversely extending bottom-edge embedded into the earthen dam, the bottom-edges of the check-walls being substantially parallel to each other and to a vertical plane passing through the dam axis, and

iii. a transversely extending substantially horizontal top-edge and defining with said bottom-edge an upright height, the check-walls top-edges being substantially horizontal and parallel to each other and to a vertical plane passing through said dam-axis; the majority of said check-walls at their top-edges being recessed below the adjacent surfaces of the earthen dam; the longitudinally separated consecutive check-walls within the region of the dam downstream-face being of progressively lower elevation whereby the top-edge of an immediately forward upright check-wall has an elevation between the top-edge and bottom-edge of the rearwardly neighboring check-wall; and

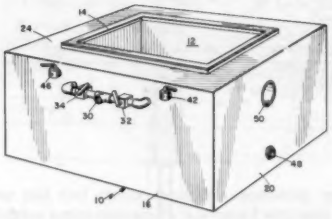
B. a plurality of intervening longitudinally, extending spacer-walls located between and attached to consecutively neighboring check-walls and for braceably maintaining the longitudinal spacing therebetween, each of said spacer-walls having an upper-edge and a lower-edge, said spacer-walls providing in concert with the check-walls a plurality of tetragonal pocket-like stilling-basins for said dam reinforcement, said spacer-walls being at least partially embedded into the earthen dam and the majority of said spacer-walls at their upper-edges being recessed below the adjacent surfaces of the earthen dam.

4,288,176

UNDERWATER AIR POCKET WORK UNIT

Thomas H. Devine, 147 Jefferson Ave., Chula Vista, Calif. 92012

Filed Mar. 23, 1979, Ser. No. 23,329
Int. Cl.³ B63L 11/10
U.S. Cl. 405—188 **10 Claims**



1. An underwater gas pocket work unit, comprising:

a structure having side walls with opposite first and second ends and defining a work chamber, wherein the work chamber is defined solely by the side walls to provide unobstructed access to the work chamber at both ends;

means for sealing the first end of the structure to an underwater work surface; and

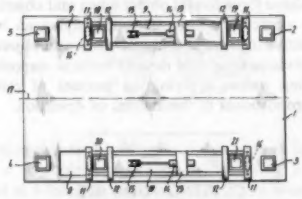
valve means in the structure for enabling a gas to enter the work chamber to provide a gaseous pocket in the upper portion of the work chamber when the first end of the structure is sealed to said underwater work surface.

4,288,177

WALKING PLATFORM CONSTRUCTION

Wim Schoonmade, Rozenoord, Netherlands, assignor to RSV-Gusto Engineering B.V., Schiedam, Netherlands

Filed May 10, 1979, Ser. No. 37,860
Int. Cl.³ E02B 17/08
U.S. Cl. 405—196 **4 Claims**



1. A walking platform construction comprising a barge or work platform and a number of legs movable in a vertical direction and securable with respect to the barge or platform, a plurality of auxiliary frames disposed in a plurality of elongated rectangular recesses in the barge or work platform that are parallel to each other, first power means for shifting each auxiliary frame relative to the barge or platform in a horizontal direction parallel to the longitudinal axis of the recess relative to and independently of the other said auxiliary frames, second power means for shifting each auxiliary frame relative to the barge or platform in a horizontal direction at 90° to said axis relative to and independently of the other said auxiliary frames, there being substantial clearance between each said auxiliary frame and the barge or platform in both said horizontal directions thereby to enable said shifting, each said auxiliary frame having at least one leg and means to move said at least one leg vertically relative to the associated said auxiliary frame.

4,288,178

APPARATUS FOR GENERATING A RETROPULSIVE FORCE ON A BODY SUCH AS A PILE

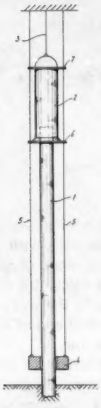
Joost W. Jansz, The Hague, Netherlands, assignor to Hollandsche Beton Groep N.V., The Hague, Netherlands

Filed Apr. 17, 1979, Ser. No. 30,808

Claims priority, application Netherlands, Apr. 18, 1978, 04128

Int. Cl.³ E02D *7/00*

U.S. Cl. 405—228 **6 Claims**



1. An apparatus for generating a retropulsive force on at least one object which tends to deviate from a desired vertical disposition under the influence of detrimental forces, said apparatus comprising:

an elongated member standing upright at a ground surface and having a desired vertical disposition;

force means guided by said elongated member;

tensioning means for supporting said force means under tension above said ground surface, said tensioning means being guided through said elongated member above said force means and supported above said elongated member by support means, said tensioning means applying no retropulsive force to said object when said object is in said desired vertical disposition, and applying an increasing retropulsive force to said object when said object increasingly deviates from said desired vertical disposition, said tensioning means applying an amount of retropulsive force proportional to the amount of deviation.

4,288,179

CUTTING TOOL BIT

Heinrich Krüger, Essen, and Hans Tack, Velbert, both of Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany

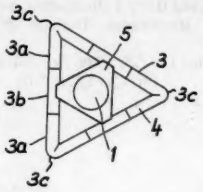
Filed Mar. 2, 1979, Ser. No. 16,945

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1978, 2810824

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—114 **13 Claims**

1. In a cutting tool bit having a central mounting hole, a planar bottom face and an opposite top face having a central zone situated at a lower level than the marginal zones thereof; chip breaking elements formed on the top face; and lateral faces defining cutting edges with the top face; the improvement wherein each cutting edge has linear length portions sloping from opposite ends of the cutting edge in the direction of its middle towards said bottom face; the improvement further comprising an elevation situated in said central zone and having an upper surface located at a lower level than the lowest point of said cutting edges; and a plurality of surfaces each situated between a respective said cutting edge and said



elevation; said chip breaking elements being formed by said surfaces and said elevation.

4,288,180

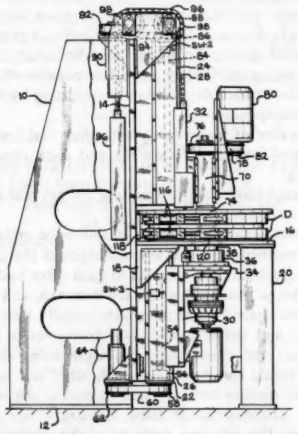
APPARATUS FOR TRUING BOLTING SURFACES OF WHEELS AND THE LIKE

David Trevarrow, 119 Reiniche, Horton, Mich. 49246

Filed Mar. 12, 1979, Ser. No. 19,970

Int. Cl.³ B21D *53/26;* B21K *1/28;* B23D *41/00*

U.S. Cl. 408—2 **25 Claims**



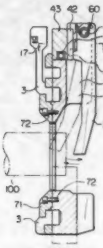
1. A machine for truing the opposite surfaces of tool deformable workpieces relative to their sides, comprising: a frame having a work station intermediate the ends of said frame, chucking means at said work station for accurately positioning a tool deformable workpiece at generally right angles to said frame, a first slide on said frame for movement toward and away from one side of said workpiece, said first slide having tooling thereon for machining surfaces of the workpiece held by said chucking means, a second slide on said frame for movement toward and away from the opposite surfaces of a workpiece held by said chucking means, a cutter on said second slide rotatable about an axis paralleling the slide movement toward and away from the workpiece, and control means holding said tooling on one of said first and second slides in cutting position against the workpiece while causing said cutter on said other one of said slides to finish its cutting operation on the workpiece.

4,288,181

DIE-HEAD OF CUTTING MACHINES

Ryo Sakaguchi, and Yoshiharu Ikenaka, both of Osaka, Japan, assignors to Rex Industries Co., Ltd., Osaka, Japan

Filed May 7, 1979, Ser. No. 36,809
Claims priority, application Japan, May 9, 1978, 53-54027
Int. Cl.³ B23B *5/12*
U.S. Cl. 408—15 **11 Claims**



1. A die-head of a cutting machine comprising a pair of relatively rotatable annular plates each having a center opening into which a workpiece to be cut extends, which plates movably hold cutting tools therebetween so that said cutting tools can be radially displaced by the relative rotation of said annular plates, wherein an improvement comprises a tool retracting lever having a projection, said tool retracting lever being, at its one end, pivotally connected to one of said annular plates, and projecting, at its other end, in said center opening of said annular plates, said other end being positioned to be engaged by the workpiece as the cutting operation approaches completion, and a slide which is slidably mounted to said one annular plate and which is integrally connected to said other annular plate so as to move therewith, said slide being always pressed in a peripheral direction of said annular plates by a spring which is arranged between said slide and said one annular plate, said slide being provided with a recessed groove into which is engaged said projection of said tool retracting lever, whereby when said tool retracting lever is pushed and pivoted by said workpiece which axially moves in said opening of said annular plates, said projection of said lever is completely disengaged from said recessed groove of said slide, thus resulting in a sudden and substantial relative rotation of said annular plates to retract said cutting tools, wherein said recessed groove of said slide into which is engaged said projection of said tool retracting lever comprises an inclined taper portion so that the slide movement of said slide gradually occurs as the cutting operation approaches completion to thereby gradually retract the cutting tools until said projection of said tool retracting lever is completely disengaged from said recessed groove of said slide.

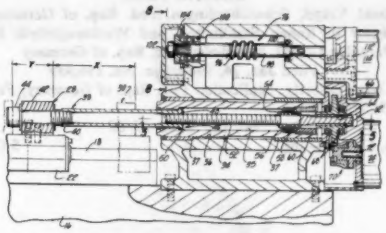
4,288,182

MACHINING APPARATUS TOOL FEED AND RETRACT SYSTEM

John Vandenkieboom, Troy, and Douglas Myers, Sterling Heights, both of Mich., assignors to LaSalle Machine Tool, Inc., Troy, Mich.

Filed Feb. 15, 1980, Ser. No. 121,747
Int. Cl.³ B23B *47/00*
U.S. Cl. 408—129 **19 Claims**

1. Machining apparatus for machining a workpiece with a work-performing tool comprising a frame, a tool carrier movably mounted on said frame for reciprocal movement relative to a workpiece, feed means for reciprocating said tool carrier between a fully retracted tool change position and a partially retracted position in a clearance relation with the workpiece and for moving said tool carrier from said partially retracted position toward and away from the workpiece through a reciprocal machining stroke, said feed means including a drive transmitting assembly having extensible and contractible means thereon connected to said tool carrier, means mounting said drive assembly on said frame for reciprocal movement substantially in the direction said tool carrier is reciprocally moved, first drive means for moving said drive assembly so as



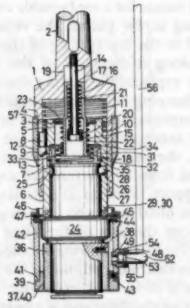
to move said tool carrier through a machining stroke, and second drive means operatively associated with said extensible and contractible means for moving said tool carrier between said fully and partially retracted positions.

4,288,183

TOOL HOLDER OR SPINDLE

Taizo Kato, 3007-104 Obatahigashijima, Moriyamaku, Nagoya, Japan

Filed Jul. 19, 1979, Ser. No. 59,255
Claims priority, application Japan, Jul. 27, 1978, 53-103852[U]
Int. Cl.³ B23B *41/00, 47/18*
U.S. Cl. 408—142 **6 Claims**



1. A rotatable tool holder for driving a tool having a pitch against a workpiece, said tool holder being adapted to be mounted in a machine and rotated on a tool holder axis, comprising a driving cylinder, a driven cylinder reciprocatable and rotatable within said driving cylinder means resiliently connecting said driven cylinder on said driving cylinder, said driven cylinder being adapted to be attached with the tool, first thread means reciprocatable and rotatable together with said driven cylinder and having the same pitch as said tool, and a second thread means in threaded engagement with said first thread means and rotatable and reciprocatable relative to said driving cylinder, said second thread means having means engageable with a member angularly immovable about the axis of said tool holder for preventing rotation of said second thread means together with said first thread means and said driving and driven cylinders, such that rotation of said first thread means forces the tool to be advanced accurately with the same pitch of the tool, and further comprising means normally connecting said driving and driven cylinders for rotation together, said driving cylinder being disconnectable from said driven cylinder to stop said driven cylinder from rotating when said

driven cylinder has moved to a predetermined position relative to said driving cylinder.

4,288,184

BORING TOOL

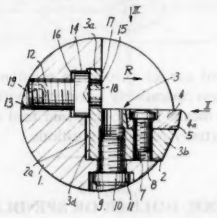
Helmut Veigel, Schwieberdingen, Fed. Rep. of Germany, assignor to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

Filed Jan. 24, 1980, Ser. No. 114,939

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 7904992[U]

Int. Cl.³ B23B *29/02*

U.S. Cl. 408—185 **5 Claims**



1. In a boring tool having a shaft and at least one support which is inserted in a cylindrical blind hole in the shaft and is attached by means of a fixing screw, the support having a rear cylindrical portion with a circular cross-section adapted to fit in the blind hole and, adjoining this, a forward approximately half-cylindrical portion with an essentially semi-circular cross-section of the same diameter, the forward half-cylindrical portion having a recess for a replaceable cutting insert through which a clamping screw passes, the recess having a seating which is parallel to the top surface of the insert which passes approximately along a diameter of the shaft and abutment surfaces for the replaceable cutting insert, and in which a thread for the clamping screw is arranged perpendicularly to the seating, the improvement comprised in that the support has a second thread arranged parallel to the first thread for the clamping screw, the second thread receiving a fixing screw which is screwed from below through an oblong hole in the shaft into the support, wherein an adjusting screw is provided in the base of the blind hole and is arranged to be parallel to and displaced from the axis of the blind hole, the adjusting screw having a cylindrical centring shoulder which is a snug fit in a passage in the shaft and, adjoining the centring shoulder, a cylindrical spigot at its forward end, which is smaller in diameter than the centring shoulder and is a snug fit in a recess of the cylindrical portion of the support, and in which the rear and-/or front end(s) of the adjusting screw have a depression to allow engagement of an adjusting tool.

4,288,185

OUTBOARD TRACING STATION FOR CARVING MACHINE

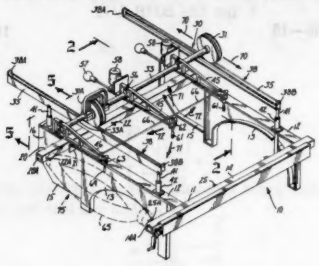
John O. Lenz, Coon Rapids, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Feb. 25, 1980, Ser. No. 124,463

Int. Cl.³ B23K *1/16*

U.S. Cl. 409—121 **5 Claims**

1. A carving machine comprising in combination a frame, said frame having fore and aft extending side members that are spaced apart laterally from each other, and cross member means holding said fore and aft extending side members together, means on said frame positioned between said side members to support workpieces to be carved, carving arm means mounted on said frame, said carving arm means also being positioned between said side members, and tracing station arm means duplicating movements of the carving arm means positioned to the lateral side of one of said side members, means to mount a pattern to the outside of one of said side members aligned with said tracing station arm means, and means to couple and support the carving arm means and the tracing station arm means which cause the movement of the tracing



station arm means to be duplicated by the carving arm means, the means to couple and support and the means to mount a pattern being supported by the frame adjacent said one side member.

4,288,186

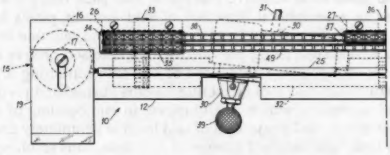
PIT CUTTER APPARATUS

Rodney O. Dockal, Alvin, and Harold A. Lindsey, Houston, both of Tex., assignors to AMF Incorporated, White Plains, N.Y.

Filed Dec. 6, 1979, Ser. No. 100,779

Int. Cl.³ B23C *1/20*

U.S. Cl. 409—175 **7 Claims**



1. Apparatus for accurately making an anomaly of predetermined size and depth in the surface of a standard for calibrating an instrument for non-destructive testing for such anomalies and indicating the severity thereof, comprising

frame means elongated along its longitudinal axis;

a pair of electro-magnetic hold-down means mounted on said frame means each having a laterally spaced pair of legs depending from said frame means for contacting the surface of the standard;

one of said hold-down means being disposed adjacent the front end of said frame means and the other of said hold-down means being longitudinally spaced therefrom intermediate the ends of said frame means;

motor means disposed between said hold-down means and having cutting means of predetermined size depending therefrom for making an anomaly in the surface of the standard when rotatably driven by said motor means;

means movable relative to said frame means for mounting said motor means and moving said motor and cutting means toward and away from the surface of the standard;

means adjacent the rear end of said frame means for manually moving said mounting means and having adjustable means for indicating when said cutting means has moved a predetermined depth into the standard;

a pair of rotatable shafts journaled in said frame means each threadedly engaging a respective end region of said motor mounting means;

means drivingly connecting said pair of rotatable shafts together; and

means drivingly connecting said means adjacent the rear end of said frame means to one of said pair of shafts for manually rotating said pair of shafts in unison to move said motor mounting means relative to said frame means.

4,288,187

ARRANGEMENT FOR PRODUCING GROOVES

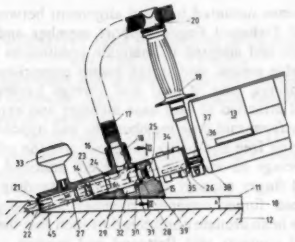
Karl Wanner, Leinfelden-Echterdingen; Wilbert Reibetanz, Leinfelden; Hans-Peter Dohse, Grafenau; Otto Baumann, Leinfelden-Echterdingen; Dietmar Spiwokz, Stuttgart; Karl Seitz, Oberkochen; Ernst Angermair, Bietigheim-Bissingen, and Herbert Wiesner, Leinfelden, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 9, 1979, Ser. No. 28,429

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1978, 2814672; Feb. 17, 1979, 2906235

Int. Cl.³ B23C *1/20*

U.S. Cl. 409—180 **34 Claims**



1. An arrangement for producing grooves in walls, ceiling and like elements of a structure by a hand-held processing machine having a tool holder, comprising a rotatable material-removing tool having an axis and driven in rotation about said axis by the processing machine, and a housing including a substantially wedge-shaped guiding piece having a bottom wall and two lateral walls and adapted to receive said tool and a slide element mounted on said guiding piece and defining a guiding surface inclined at an acute angle to said axis of the tool and adapted to lie in contact with a wall or ceiling to be machined, said slide element having two opposite members defining said guiding surface, and positioned so as to provide a clearance therebetween through which said tool extends, said tool including a cross-bit having a shaft and a cruciform cutting head on said shaft, said cutting head having a guiding portion which is formed as an axially extending centering point provided cutting blades; and a holding device arranged to detachably connect said guiding piece to the processing machine and adjustable relative to said tool in a longitudinal direction of the latter in dependence upon differing lengths of said tool and the tool holder, and also adjustable about a further axis extending transverse to said axis of said tool which accompanying adjustment of said acute angle in dependence upon differing diameters of said tool, each of said guiding members being a bent-off portion of a respective one of said lateral walls of said guiding piece.

4,288,188

TIE DOWN

Edward R. Smith, Denville, N.J., assignor to Patent Products, Inc., East Hanover, N.J.

Filed Aug. 24, 1978, Ser. No. 936,526

Int. Cl.³ B60R *7/00*; A44B *31/00*

U.S. Cl. 410—97 **12 Claims**

4. A tie down comprising

a self-supporting flexible metal cable of limited length having one end looped over onto an intermediate portion of said cable to define a loop;

a clamp securing said one end of said cable to said intermediate portion;

a ferrule secured to said cable at an opposite end from said loop, said ferrule having a bore passing therethrough on an axis perpendicular to the axis of said cable; and

a plastic coating covering said cable, clamp and ferrule.

4,288,189

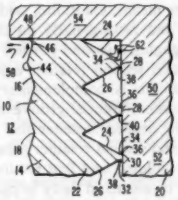
THREADED INSERT

Theodore Ziaylek, Jr., Yardley, Pa., assignor to Yardley Products Corp., Yardley, Pa.

Filed Aug. 10, 1979, Ser. No. 65,490

Int. Cl.³ F16B *37/12*

U.S. Cl. 411—180 **8 Claims**



1. A threaded insert, particularly usable fixedly positioned in a base material which is molded, comprising a generally cylindrical body including a securement means about the outer surface thereof to facilitate the securing of the threaded insert to the surrounding molded base material, said cylindrical body defining a vertically extending central bore therethrough including a thread means on the walls thereof, each of said thread means comprising:

(a) an upper thread face extending centrally inwardly and downwardly from the walls of said central bore;

(b) a lower thread face extending centrally inwardly and upwardly from the walls of said central bore;

(c) a thread end extending from the innermost end of said upper thread face to the innermost end of said lower thread face, said thread end extending in a direction generally parallel to the axis of said central bore;

(d) an upper thread edge defined along the inner section of said upper thread face and said thread end;

(e) a lower thread edge defined along the intersection of said lower thread face and said thread end;

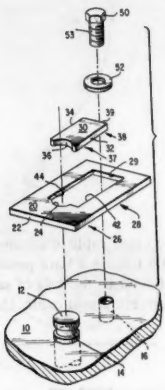
said upper face including an upwardly extending section directly adjacent said upper thread edge to prevent flow of base material thereby during material molding, said lower thread facing including a downwardly extending section directly adjacent said lower thread edge to prevent flow of base material thereby during material molding.

4,288,190

TWO-PIECE GROOVED PIN RETAINER

Samuel L. Benson, Clinton, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 22, 1979, Ser. No. 87,581
Int. Cl.³ F16B 21/16
U.S. Cl. 411—511 8 Claims



1. Apparatus for retaining a pin having a circumferential groove, said pin projecting through a bore defined in the surface of a housing, comprising:

(a) first retainer means, resting flatly on the surface of said housing, for engaging a first portion of said circumferential groove;

(b) second retainer means, encircling said pin and said first retainer means and resting flatly on the surface of said housing, for engaging a second portion of said circumferential groove, said second retainer means having a first interior edge which is complementary to said second portion of the circumferential groove; and

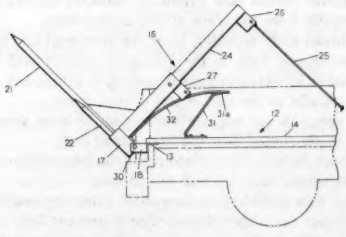
(c) one removable headed fastener for holding said first retainer means and second retainer means together about said pin and for holding said first retainer means and said second retainer means fixed flatly in place relative to the surface of said housing such that said pin is free to rotate relative to said housing.

4,288,191

HAY BALE HANDLING MECHANISM

Bobby R. Lynch, Ozark, Mo., assignor to Tri-L Manufacturing, Inc., Ozark, Mo.

Filed Oct. 3, 1979, Ser. No. 81,468
Int. Cl.³ B66F 11/00
U.S. Cl. 414—24.5 13 Claims



1. A bale handling mechanism adapted to mounting on the bed portion of a pick-up truck or the like comprising

a base member for attachment to said truck bed portion,

a T-shaped finger support member comprising a cross-member and a central member, one end of said central member being secured to said cross-member and extending transversely from said cross-member and the opposite end thereof being free, said cross-member being pivotally mounted on said base member adjacent the rearward end of said base member and said truck bed portion for pivotal movement between a lowered position in which said central member extends upwardly from said cross-member and a raised position in which said central member extends forwardly above said base member and said truck bed portion,

a plurality of elongated finger members attached to and projecting rearwardly from said pivotally-mounted cross-member in its lowered position and adapted to penetrate and support the bale,

cable means connected to the free end portion of the central member of said T-shaped finger support member,

winch means mounted on said base member spaced from said pivotal T-shaped finger support member and connected to the other end of said cable means and adapted to raise said bale,

spring means mounted in lineal alignment between the said pivotal T-shaped finger support member and said base member and adapted to maintain continuous tension on said cable means, said spring means comprising a pair of leaf springs, one of said leaf springs having one end thereof attached to said base member and extending upwardly from said base member, the end opposite said one end being free and being flattened, and the other of said leaf springs having one end thereof attached to said T-shaped finger support member and extending from said T-shaped finger suppport member upwardly and forwardly in an arcuate configuration such that the underside thereof contacts said flattened end portion of said leaf spring when said T-shaped finger support member is in said lowered position,

whereby as said T-shaped finger support member is moved by said winch means from said lowered position to said raised position the underside of said other leaf spring is caused to slide forwardly over said flattened end of said one leaf spring, said one leaf spring is pressed downwardly in the forward direction by said other leaf spring and said other leaf spring is compressed towards a less arcuate configuration by said one leaf spring.

4,288,192

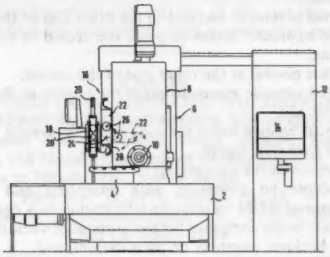
TOOL-CHANGING MECHANISM

Michael Geiger, Starnberg; Manfred Schneider, Grossbottwar, and Jörg Lützkendorf, Markgroeningen, all of Fed. Rep. of Germany, assignors to Friedrich Deckel Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 1, 1979, Ser. No. 80,602
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1978, 2844319
Int. Cl.³ B23Q 3/157
U.S. Cl. 414—223 18 Claims

1. A tool-changing mechanism for tool machines of the kind having a working spindle which receives a tool, said tool-changing mechanism including a tool magazine which contains several tools and a double-arm tool-changing arm which has on its two ends respective gripping mechanisms, said tool-changing arm being rotatable about an axis of rotation parallel to the spindle axis and being movable along the direction of said axis of rotation, said arm having a gripping position in which it simultaneously grips a tool which is in the magazine and a tool which is in the working spindle and exchanges these tools by rotation about said axis of rotation, said arm being pivotable about a pivot axis between a working position and a rest position outside of the spindle area, said pivot axis being parallel to said axis of rotation and to said spindle axis, wherein the improvement is comprised by means locating said pivot

axis on said machine and with respect to said axis of rotation for pivoting of said tool-changing arm about its pivot axis from its said rest position into its said gripping position directly and



thus without need for rotation about its said axis of rotation, and for later pivoting of said tool-changing arm back to its said rest position.

4,288,193

ARRANGEMENT FOR FORMING AND HANDLING COLLECTIVE LOADS

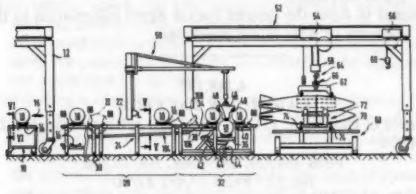
Gert Klausbruckner, and Konrad Sieber, both of Moosburg, Fed. Rep. of Germany, assignors to Steinbock GmbH, Moosburg, Fed. Rep. of Germany

Filed Feb. 6, 1980, Ser. No. 119,117

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1979, 2906457

Int. Cl.³ B64D *7/00*

U.S. Cl. 414—342 **45 Claims**



1. An arrangement for assembling and conveying a number of elongated generally cylindrical single loads which are collectively supported in a collecting carrier, comprising an elongated single load supply track for delivering the single loads to a collecting location so that each of the single loads extends transversely of the longitudinal direction of said supply track, a single load positioning device at said collecting location for arranging three of the single loads from said supply track in a triangular configuration so that the longitudinal axes of the single loads extend parallel to one another, said positioning device including a first and a second load stand each arranged to support a different one of the single loads at the same level as the single loads on said supply track, and a third single load stand between said first and said second single load stands for supporting a third single load, said third single load stand including means for lowering the third single load from the level of said supply track to a certain level below that of the single loads supported on said first and said second single load stands, a handling device for attaching the single loads positioned in said single load positioning device to the collecting carrier to form a collective load, a hoist arrangement for removing the collective load from said single load positioning device, and means for conveying the collective load to a collective load receiving location after the collective load is released from said hoist arrangement.

4,288,194

RAW MATERIAL DISTRIBUTING APPARATUS FOR A FURNACE

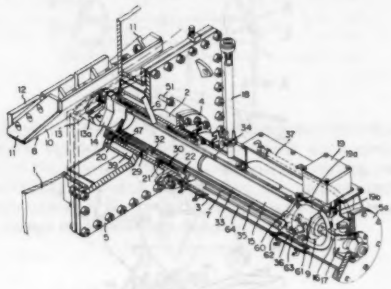
Susumu Nemoto, Kawasaki, and Toshio Fujieda, Togoshi, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1979, Ser. No. 23,533

Claims priority, application Japan, Apr. 4, 1978, 53-38811

Int. Cl.³ F27B *1/20*

U.S. Cl. 414—586 **8 Claims**



1. A raw material distributing apparatus for a furnace, comprising

an armer rod slidable with respect to said furnace;

a distributing plate for charged raw material secured at a front end of said rod;

a casing for holding said rod;

a sliding bearing comprising hard synthetic resin arranged on an inner wall of said casing between said casing and said rod;

a non-metallic dust sealing mechanism disposed toward an end of said sliding bearing;

means for supplying sealing gas to said dust sealing mechanism; and

cooling means having part hereof disposed within said rod and toward a front end of said casing, to cool the interior of said rod, and an outer circumference of said front of said casing;

wherein said sealing mechanism comprises a unit casing, a first oil seal, a second oil seal, a set of supports, said unit casing being independent of said casing holding said rod, said first oil seal being secured to said unit casing and contacting its lip end to the outer periphery of said rod, said second oil seal being secured at the front end directed toward the furnace of said unit casing and being packed with adiabatic material for spouting out the sealing gas from the lip pointed into said furnace, and said supports being of hard synthetic resin and secured to said unit casing.

4,288,195

ROLL-AWAY WHEEL TRUCK AND LIFT TABLE ASSEMBLY

John Brewer, Scarborough, Me., assignor to Southworth, Incorporated, Portland, Me.

Continuation-in-part of Ser. No. 46,521, Jun. 7, 1979, Pat. No. 4,219,186. This application Dec. 14, 1979, Ser. No. 103,792

Int. Cl.³ B60P *1/02*

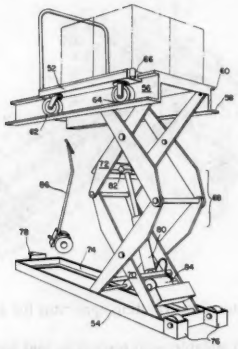
U.S. Cl. 414—608 **4 Claims**

1. A roll-away lifting combination which essentially comprises a vertically extendable lift table assembly and a cooperating wheeled truck assembly that is operable for a selective, roll-away superposed mating upon said lift table assembly; wherein,

(a) said lift table assembly comprises a horizontally extending working platform which is positioned above, and operable to be vertically extended by, a scissor jack link-

work assembly, said working platform further comprising at least one horizontally extending and longitudinally disposed flange and at least one horizontally extending guideway which is also horizontally disposed and spaced above said flange; wherein,

(b) said wheeled truck assembly comprises a load platform supported upon wheels which maintain the load platform underside at a first distance above a ground reference, said first distance being sufficient to allow said truck assembly to be horizontally wheeled from a ground reference onto said horizontally extending flange of said working platform when said lift table assembly is in a lowered position upon said ground reference, said wheeled truck assembly further including means to vertically surround and frictionally engage said horizontally extending guideway of said lift table assembly when so wheeled thereover, whereby said wheels are operable to be selectively positioned upon said flange while maintained against any transverse movement, and retarded against any longitudinal movement, by said guideway, wherein said truck assembly is operable to be raised to any desired vertical elevation above said ground reference, and then selectively wheeled off, in said longitudinal direction.

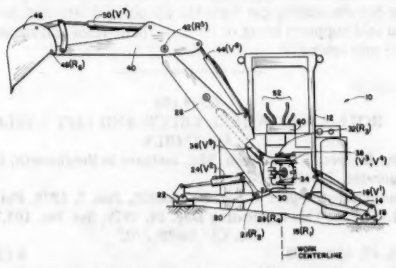


4,288,196

COMPUTER CONTROLLED BACKHOE

James O. Sutton, II, 14515 East Rd., Montrose, Mich. 48457

Filed Jun. 14, 1979, Ser. No. 47,735
Int. Cl.³ E02F *9/26, 3/87*
U.S. Cl. 414—699 **4 Claims**



1. In a vehicle having

a frame having an imaginary "x" or roll axis and a "y" or pitch axis,

at least two outriggers pivotal to the frame to level the frame relative to the "x" axis,

a a first and a respective second hydraulic actuator to move each respective outrigger,

a backhoe assembly comprising a boom pivotal at one end to the frame,

hydraulic means to pivot the boom in a vertical plane, and

boom hydraulic means to pivot the boom in a horizontal plane,

a crowd pivotal at one end to the other end of the boom,

crowd hydraulic means to pivot the crowd in the vertical plane,

a bucket pivotal at the other end of the crowd,

bucket hydraulic means to pivot the bucket in the vertical plane, and

a manual control valve for each of the hydraulic actuators and hydraulic means,

the improvement comprising:

a multiple bit computer with interphase and pre-programmed ROM to provide information to a central processor in the computer for the purpose of vectorization of the backhoe assembly or parts thereof, and

means to controllably provide required voltages to the computer,

a dual axis gyro fixed to the frame means in the computer to continuously sense the position of the "x"–"y" axes,

variable resistors located at the pivot axes of the outriggers, the boom, the crowd, and the bucket to sense the pivotal position of each outrigger, the boom, the crowd and the bucket relative to the "x"–"y" axial position of the frame,

means to electrically operate each of the control valves;

switch means to select manual or computer operation of the valve,

switch means to activate and interconnect the gyro with the interphase of the computer and to generate a signal to operate the outrigger hydraulic actuator to level the frame,

visual means to indicate an unsafe position of the frame,

switch means to activate the computer to allow it to receive desired programming of the bucket depth relative to a given elevation,

means to input the desired bucket depth information to the memory (RAM) of the computer.

4,288,197

CARTRIDGE PACKAGE

Richard C. Gurolnick, 1311 N. Rand Rd., Arlington Heights, Ill. 60004

Filed Jun. 21, 1979, Ser. No. 50,804
Int. Cl.³ F42B *37/00, 39/00*
U.S. Cl. 414—786 **2 Claims**

1. A method of using a cartridge package having a cartridge retaining panel with spaced apertures therein for cartridges having bullet ends smaller than the apertures and rim ends larger than the apertures, comprising the steps of:

a. inserting the bullet ends of the cartridges in one direction through the spaced apertures in the cartridge retaining panel,

b. folding another portion of said package over the rim ends of the cartridges so the rims of the cartridges are located between the other portion and cartridge retaining panel,

c. securing the cartridge retaining panel and other portion together to retain the cartridges,

d. holding the package in one hand with the bullet ends pointing away from the palm,

e. encircling a portion of the package and cartridges extending therefrom with the thumb and fingers of the one hand holding the package, and

f. manipulating a finger and thumb on the one hand holding the package to withdraw a cartridge from the package in said one direction with the rim of the cartridge being withdrawn being forced through its respective aperture.

4,288,198

METHOD OF CONTROLLING MULTISTAGE CENTRIFUGAL COMPRESSOR EQUIPMENT

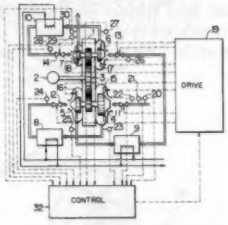
Yozo Hibino; Junichi Oizumi; Hideo Nishida; Yoshiyuki Nakano, and Hiroshi Ohmachi, all of Shimoinayoshi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 15, 1979, Ser. No. 94,733

Claims priority, application Japan, Mar. 12, 1979, 54-27744

Int. Cl.³ F04D *15/00*

U.S. Cl. 415—1 **3 Claims**



1. A method of controlling multistage centrifugal compressor equipment having inlet guide vanes and diffuser vanes mounted at each stage in variable angle position, the method comprising the steps of:

determining which one of a range of operating conditions near the desired operating conditions and a range of operating conditions remote from the desired operating conditions the prevailing operating conditions of the compressor equipment are in; and

controlling a combination of the amount of operation of the inlet guide vanes with the amount of operation of the diffuser vanes, which is determined beforehand, along an operating line of the compressor equipment so as to bring the prevailing operating conditions to the range of operating conditions near the desired operating conditions when the prevailing operating conditions are determined to be in the range of operating conditions remote from the desired operating conditions, and effecting fine adjustments of the inlet guide vanes and diffuser vanes to shift the efficiency of operation to a higher level within a range that the prevailing operating conditions do not deviate from the desired operating conditions when the prevailing operating conditions are determined to be in the range of operating conditions near the desired operating conditions.

4,288,199

TARP YAW TRACK MEANS FOR ROTORS

Alfred L. Weisbrich, 76 Mayflower Rd., Windsor, Conn. 06095

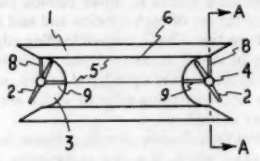
Continuation-in-part of Ser. No. 763,936, Feb. 25, 1977, Pat. No. 4,156,579. This application Dec. 21, 1978, Ser. No. 971,924

Int. Cl.³ F03D *3/04*

U.S. Cl. 415—2 R **10 Claims**

1. A power generating device comprising:

a fluid flow velocity augmentor structure means being substantially the shape of a concentric interior section of a hollow toroid of general arbitrary cross-section in both vertical and horizontal planes, meaning that in both a vertical and horizontal plane cross-sections may not be limited to circular arc and circular sections respectively, providing thereby open peripheral fluid flow channel means and defining augmented flow velocity regions about the exterior periphery of said fluid flow augmentor structure wherein a plurality of interconnected fluid impact impellers are mounted within said peripheral fluid flow channel; Track means, mounted on the fluid flow augmentor structure substantially concentric to the peripheral fluid flow channel, with said interconnected fluid impact impellers mounted for yaw upon track means within the peripheral fluid flow channel for tracking and maintaining alignment with shifting flow augmentation fields relative to flow augmentation structure in response to change in ambient flow direction.



4,288,200

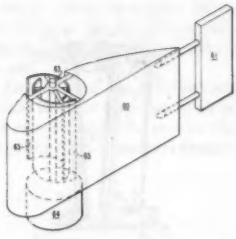
WIND TOWER TURBINE

Louis R. O'Hare, 1041 Ponderosa Apt. 2, Fort Collins, Colo. 80521

Filed Apr. 25, 1979, Ser. No. 33,195

Int. Cl.³ F03D *3/04*

U.S. Cl. 415—2 R **2 Claims**



1. A wind driven turbine comprising:

(1) a wind energy to rotary motion conversion means in the form of impeller blades so formed with regard to curvature that wind striking the concave side of the curvature interacts with the blade to tend to move it more than it tends to move it in striking the opposite convex side and said blades being so positioned on and attached to a rotating member means such as a shaft, said shaft being vertically disposed and supported by thrust bearings in a base structure that is in the form of a housing capable of containing an energy extraction means such as a generator, said rotating member means being caused to rotate in a horizontal plane of rotation paralell to the plane of the wind's movement such that for each blade that is impelled to move in the direction of the wind another blade fastened to the opposite side of the rotatable member is caused to move counter to the wind thereby causing said shaft to rotate and,

(2) a single convex airfoil wind shielding and wind accelerating means rotable about the same axis as the axis about which the turbine impellers rotate and rotably secured to said verticle shaft by means of support bearings both above and below the rotable impeller means and said wind accelerator means being pivotable on said support bearings, the length of the leading edge of said convex airfoil extending vertically and said convex airfoil having within

it an approximately cylindrical cavity the length of which cavity is vertically disposed with said cavity being of sufficient diameter to enclose the rotating impeller blades except at approximately that area on the surface of the convex curvature of the airfoil where the cord of the airfoil reaches maximum thickness, said cylindrical cavity in that area opening through the airfoil's convex surface to permit rotating blades to move outside the cavity for a portion of the arc of each rotation and said airfoil being of such a shape that it has a convex leading edge and sides at least one of which is convex with a lengthwise verticle opening to an internal cylindrical cavity, said airfoil also having a tapered trailing edge to which are attached support tubes to hold,

(3) wind shield-accelerator directing means in the form of a weathervane which is a flat rectangular plate with its length extending vertically and capable of interacting with the relative wind to position the airfoil's leading edge to confront the approaching wind and,

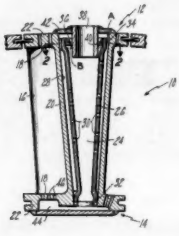
(4)energy extraction means whereby the energy imparted to the turbine blades is transmitted to an energy requireing unit such as a generator by means of attachment to the shaft in its base mounting.

4,288,201

VANE COOLING STRUCTURE

Gregory S. Wilson, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 14, 1979, Ser. No. 75,397
Int. Cl.³ F01D *9/02*
U.S. Cl. 415—115 **5 Claims**



1. A coolable stator vane structure of the type disposed across the path of high temperature working medium gases in a rotary machine, the vane structure including:

an airfoil section having a hollow cavity extending thereacross including an interior surface defining said cavity;

a tubular insert disposed in said cavity which is fixedly attached at one end to the interior surface and is slidable at the opposing end with respect to the interior surface of the vane;

a closure plate affixed to the slidable end of the insert and having an aperture therein;

a tube extending through the aperture of the closure plate through which cooling air is flowable to the hollow cavity of the airfoil section.

4,288,202

FAN HAVING INTERNAL POLYHEDRAL STRUT FRAME

Paul S. Buckmann, Roseville, Calif., assignor to Aerojet-General Corporation, LaJolla, Calif.

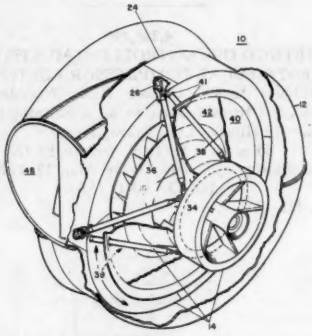
Filed Jun. 20, 1977, Ser. No. 807,961
Int. Cl.³ F01D *25/16, 25/24*
U.S. Cl. 415—142 **9 Claims**

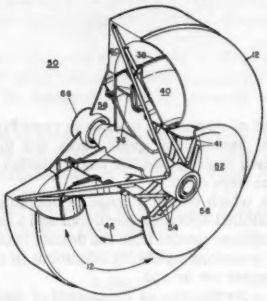
1. A fan comprising:

a bladed impeller;

a housing for said impeller defining a substantially enclosed area having at least one air inlet and one air outlet; and

a housing support frame comprised of a plurality of struts disposed within said housing, at least one support ring supporting said struts, and means connecting said struts to





said housing, each strut extending from said at least one support ring to said housing across the air flow path between said impeller blades and said air outlet at a non-orthoginal angle to said impeller, each end of said struts juxtatosed to an end of an adjacent strut to define a zig zag star shaped-pattern.

4,288,203

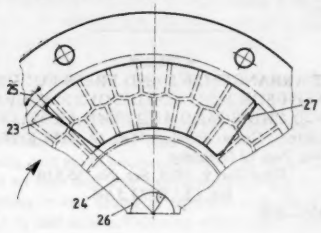
MULTI-FLOW GAS DYNAMIC PRESSURE-WAVE MACHINE

Reinhard Fried, Nussbaumen, and Günter Kudernatsch, Klingnau, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Aug. 23, 1979, Ser. No. 69,121
Claims priority, application Switzerland, Oct. 2, 1978, 10216/78
Int. Cl.³ F04F *11/02*
U.S. Cl. 417—64 **11 Claims**

1. In a multi-flow gas-dynamic pressure-wave machine of the type comprising a rotor, the rotor including a hub tube and a shroud located radially outwardly thereof to form a cell zone therewith for receiving a gaseous working media, the cell zone being subdivided into at least two concentric flow channels by means of at least one intermediate tube arranged between the hub tube and the shroud, cell walls disposed in each flow channel, a housing enclosing the rotor, an air housing, a gas housing, and ducts for the supply and removal of the gaseous working media relative to the rotor, the improvement wherein the cell walls of one flow channel and the cell walls of an

adjacent flow channel are circumferentially staggered with respect to one another by essentially one-half the circumferential interface between such cells, and a point of intersection of the center line of an outer cell wall with the center line of the



intermediate tube is farther away radially from the axis of the rotor than the point of intersection of the center line of an adjacent inner cell wall with the center line of the intermediate tube.

4,288,204

SUPPORT FOR MULTI-STAGE COMPRESSORS

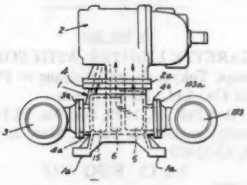
Albin Viertler, Saarwellingne, Fed. Rep. of Germany, assignor to Klein, Schanzlin & Becker AG, Frankenthal, Fed. Rep. of Germany

Filed Feb. 23, 1979, Ser. No. 14,476

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1978, 2808952

Int. Cl.³ F04B *25/00*

U.S. Cl. 417—243 **10 Claims**



1. In an aggregate wherein a compressor for a fluid medium includes a series of successive stages and is connected with at least one heat exchanger means, wherein a next-following stage of said series, as considered in the direction of flow of fluid medium through the compressor, is disposed between first and second preceding stages and therein each stage of the compressor and each heat exchanger means has an inlet and an outlet, a hollow support for said compressor and said heat exchanger means, said support including a partition and having first and second chambers disposed at the opposite sides of said partition and respectively interposed between the outlets of said first and second stages and the inlets of said second and next-following stages, said support further having first and second passages respectively interposed between the outlets of said first and second stages and said first and second chambers, said one heat exchanger means being connected between the outlet of one of said first and second stages and the respective passage.

4,288,205

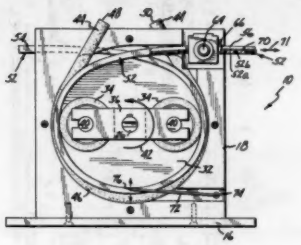
VARIABLE VOLUME PERISTALTIC PUMP

Keith L. Henk, Brooklyn Park, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Jan. 18, 1980, Ser. No. 113,331

Int. Cl.³ F04B *43/12, 45/08*

U.S. Cl. 417—477 **16 Claims**



1. A peristaltic pump comprising:

housing means with an arcuate chamber defined by an arcuate wall;

rotor means coaxially positioned within the arcuate chamber;

a plurality of roller means spaced circumferentially within the arcuate chamber and rotatably attached to the rotor means;

flexible conduit means circumferentially arranged within the arcuate chamber;

adjustable band means circumferentially arranged in the arcuate chamber between the flexible conduit means and the roller means for longitudinally engaging the flexible conduit means; and,

adjusting means for adjusting the effective length of the flexible band means to adjust the extent of flattening of the flexible conduit means against the arcuate chamber wall and thereby adjusting the volumetric capacity thereof.

4,288,206

AUTOMATIC MULTIPLE WATER SAMPLER

David C. Tigwell, 401 E. Colorado, Urbana, Ill. 61801, and David J. Schaeffer, 1716 E. Walnut St., Chatham, Ill. 62629

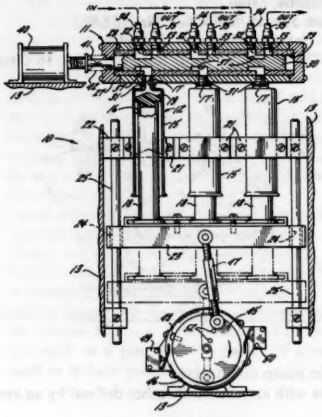
Filed Aug. 15, 1979, Ser. No. 66,518

Int. Cl.³ F04B *7/00, 21/08*

U.S. Cl. 417—517 **1 Claim**

1. A sampler for delivering multiple independent water samples comprising, in combination, a frame, a drive bar mounted in said frame for linear reciprocation, a plurality of glass chambered syringes having movable plungers mounted in said frame with their axes parallel to the direction of said bar reciprocation, said plungers being coupled to said drive bar, a valve body on said frame having a chamber opening to the chambers of said syringes, said body having an inlet and an outlet opening for each of said syringes, a valve spool shiftably mounted in said valve body chamber and having relieved regions for alternately connecting said syringe chambers with said inlet and then said outlet openings upon shifting of said spool, and means for reciprocating said drive bar and shifting said spool so that said syringe will draw liquid from said inlet openings and then positively discharge that liquid through said

outlet openings, said plungers having non-wetting plastic pistons in wiping contact with said glass chambers, said valve



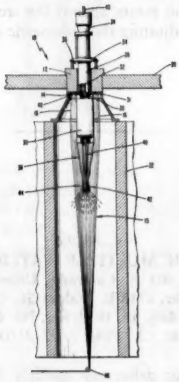
body chamber being defined by a glass tube, and said valve spool being formed of non-wetting plastic.

4,288,207

APPARATUS FOR PRODUCING MELT-SPUN FILAMENTS

William W. Wilkes, Florence, S.C., assignor to Fiber Industries, Inc., New York, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,425
Int. Cl.³ B29C *25/00*
U.S. Cl. 425—72 S **3 Claims**



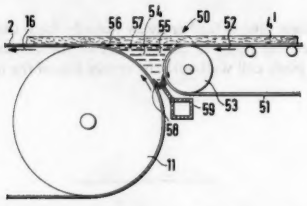
1. In apparatus for the manufacture of melt-spun filaments, said apparatus being of the type wherein molten polymer is extruded downwardly through a filter pack and through an annular array of holes of a spinneret to form a circularly arranged group of filaments, quench gas supply conduits means extending downwardly through said pack and said spinneret coaxially relative to said row of holes, said conduit means including gas discharge means disposed above said guide for discharging quench gas outwardly through the group of filaments, means for applying a finish substance onto said filaments, and a guide below said finish applying means for gathering and redirecting the filaments, the improvement wherein said finish applying means comprises finish supply conduit means extending downwardly through said pack and said spinneret within said quench gas supply conduit means, said finish supply conduit means projecting below said gas discharge means coaxially within the group of filaments and including a means for discharging finish outwardly onto the filaments wherein said finish discharge means is disposed above the midpoint of the distance between said spinneret and said guide.

4,288,208

BELT ARRANGEMENT AND PRESS EQUIPPED THEREWITH FOR THE CONTINUOUS MANUFACTURE OF WOOD CHIPBOARD AND SIMILAR MATERIALS

Eduard Küsters, Gustav-Fünders-Weg 18, 4150 Krefeld-Forstwald, Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 55,510
Int. Cl.³ B29J *5/08*
U.S. Cl. 425—371 **9 Claims**



1. In a belt arrangement including two endless belts revolving about deflection cylinders with their axis parallel to each other, for transporting loose, finely divided material, the upper sections of which belts are in approximately the same plane, said belts being driven in the same transport direction and following each other immediately in the transport direction and thus forming an upper wedge space between the two belts; and an auxiliary device for transferring the material from one belt to the next one, an improved auxiliary device comprising:

a liquid which is of higher specific gravity than the material to be transported and does not wet the latter in the upper wedge between the last deflection cylinder of the first belt and the first deflection cylinder of the following belt; and

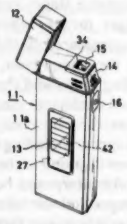
means sealing said wedge at the bottom and sides.

4,288,209

GAS CIGARETTE LIGHTER WITH SOLAR CELL

Sadao Yoshinaga, Tokyo, Japan, assignor to Prince Industrial Development Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1979, Ser. No. 16,190
Claims priority, application Japan, Mar. 2, 1978, 53-26870; May 29, 1978, 53-72473
Int. Cl.³ F23Q *7/12*
U.S. Cl. 431—255 **5 Claims**



1. A gas cigarette lighter comprising:

a casing having an opening in one side thereof;

a fuel tank mounted within said casing;

a nozzle through which the gas flows when the lighter is actuated, said nozzle being coupled to said fuel tank;

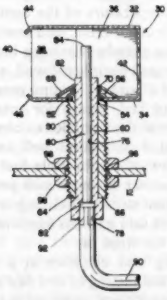
an electrical circuit comprising a discharge means;
electrical storage means connected as part of said discharge means;
a solar cell unit formed as a thin plate having at least one hole therein, said solar cell unit having at least one solar cell and being connected to said discharge means so as to electrically charge said electrical storage means;
an ignition switch in one wall of said casing;
a cover for said discharge means;
at least one protrusion on said cover, said solar cell unit being mounted to said cover of said discharge means with said protrusion extending into said hole in said plate; and
guide means framing at least part of said opening in said casing, said guide means positively retaining said solar cell unit so that said solar cell element is aligned with said opening in said casing to facilitate reception of light energy by said solar cell element when said discharge means, cover and solar cell unit are mounted in said casing.

4,288,210

GAS COLLECTOR/IGNITER FOR GRILLS

Murray Leonard, Mayfield, and Herbert F. Jugl, Bedford, both of Ohio, assignors to Vernitron Corporation, Lake Success, N.Y.

Continuation-in-part of Ser. No. 941,281, Sep. 11, 1978, Pat. No. 4,226,930. This application Jul. 17, 1979, Ser. No. 58,391
Int. Cl.³ F23Q *7/06;* **H01T** *13/20*
U.S. Cl. 431—263 **9 Claims**



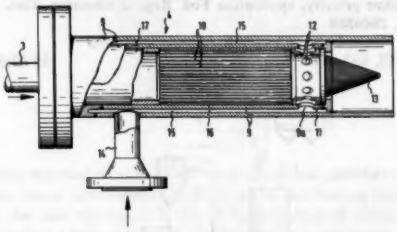
1. A spark igniter for gas burners comprising: a gas collector formed of metal and having spaced top, bottom and side walls defining a collector chamber, a gas inlet to said chamber, a collector mounting tube having one end portion secured to said bottom wall against relative longitudinal and rotational movement between said gas collector and said mounting tube, said tube having a free end opposite from said one end portion, a hole in said bottom wall aligned with said tube, a ceramic sleeve having an electrode mounted therein and including an electrode tip extending therefrom, said sleeve being received in said tube with said electrode extending through said hole and with said electrode tip positioned in said collector chamber, said sleeve having an outwardly extending sleeve shoulder generally opposite from said electrode tip, said sleeve shoulder bearing against said free end of said tube for locating said electrode tip a predetermined distance from said top wall, and fastener means securing said sleeve in said tube.

4,288,211

PROCESS AND DEVICE FOR THE INTRODUCTION OF EXPLOSIVE GASES INTO A COMBUSTION CHAMBER

Kurt Bodenbenner, Wiesbaden; Gerhard Müller, Kelkheim, and Helmut Perkow, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 27, 1978, Ser. No. 973,585
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2758819
Int. Cl.³ F23D *13/46*
U.S. Cl. 431—346 **2 Claims**



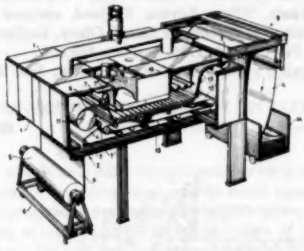
1. A device for the introduction of explosive gases into a combustion chamber comprising a tubular casing, a bundle of tubes in the casing, each having an internal diameter of at most twice the quenching distance of the explosive gases, said casing being partially provided with a double shell defining a hollow space and the bundle of tubes opening into a spacer ring, said spacer ring being provided with a jacket having openings which are in communication with the hollow space of the double shell.

4,288,212

METHOD AND APPARATUS FOR FIXING A BINDING AGENT

Jacobus G. Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Netherlands

Continuation-in-part of Ser. No. 871,927, Jan. 24, 1978, abandoned. This application Apr. 2, 1979, Ser. No. 26,404
Int. Cl.³ F26B *13/00;* **F27B** *9/28*
U.S. Cl. 432—8 **8 Claims**



7. A method of fixing the binding agent of a dyestuff to a printed web of material by means of heat comprising the steps of introducing said web into a closed chamber, subsequently depositing said web on moving support members and heating said web to treatment temperature, said temperature continues acting on the web during its stay within the chamber, whereafter discharging said web of material from the chamber, and depositing said web on a supporting belt within the closed chamber, the velocity of supply and discharge of the web exceeding the traveling velocity of the supporting belt for promoting a tension-free formation of loops, while, prior to

depositing said web on the belt, heating said web to almost the treatment temperature by contact with a source of heat in order to prevent difference of temperature in the formation of loops.

4,288,213

METHOD AND APPARATUS FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIAL

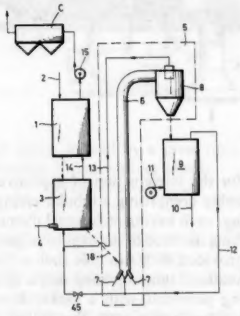
Horst Herchenbach, Troisdorf; Hubert Ramesohl, Bergisch-Gladbach, and Joachim Fleischer, Lohmar, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Oct. 15, 1979, Ser. No. 84,582

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1978, 2846584

Int. Cl.³ F27B *15/00*; C04B *7/02*

U.S. Cl. 432—14 **15 Claims**



1. In a method for heat treating a fine-grained material in which said material is sequentially passed through a pre-heating zone, a calcining zone, a sintering zone, and a cooling zone, the improvement which comprises separately heat treating the calcined material from said calcining zone to volatilize lower melting components, suspending the substantially calcined and heat treated material as an airborne suspension in said sintering zone and sintering the suspension in said sintering zone.

4,288,214

ARRANGEMENTS FOR FEEDING FLUIDIZING GAS TO A FLUIDIZED BED COMBUSTION APPARATUS

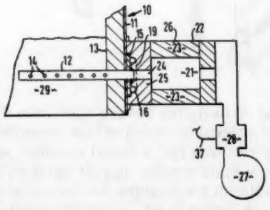
Maurice Harman, Milton Keynes, England, assignor to The Energy Equipment Company Limited, Olney, England

Filed Jan. 4, 1980, Ser. No. 109,635

Claims priority, application United Kingdom, Jan. 10, 1979, 00928/79

Int. Cl.³ F27B *15/00*; F26B *17/00*; F27D *1/12*

U.S. Cl. 432—58 **10 Claims**



1. A fluidised bed combustion arrangement comprising a container having walls for housing a bed of inert particulate material, at least one supply tube passing into said container through at least one of said walls to extend into said bed of inert particulate material, each said supply tube having apertures formed along the length thereof and having its outermost end coupled to a fluidising gas supply means operable to pass fluidising gas thereto whereby gas from said fluidising gas supply means passes into said container via said supply tubes and passes via said apertures into said bed of inert particulate material to fluidise said bed, the outermost end of each said supply tube being fixed to a wall of the container of the fluidised bed, cooling means mounted in intimate thermal contact with that portion of said wall adjacent the ends of each of said at least one supply tube, said cooling means including a liquid coolant passing therethrough to cool that portion of said wall adjacent the outermost end of said at least one supply tube.

4,288,215

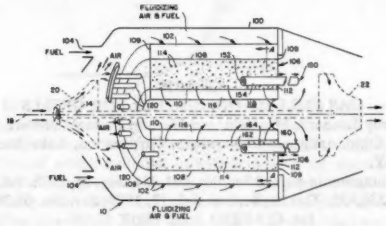
METHOD AND APPARATUS FOR PREHEATING A ROTATABLE FLUIDIZABLE BED

George B. Grim, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 117,587, Nov. 5, 1979. This application May 27, 1980, Ser. No. 153,009

Int. Cl.³ F27B *7/00*

U.S. Cl. 432—103 **5 Claims**



1. A method for preheating a rotating fluidized bed combustor to the ignition temperature of the exothermic combustion reaction desired to occur therein, said combustor including an elongated fluidization chamber having a longitudinally extending axis and a perforated peripheral wall, a bed of pulverulent solid particles in said chamber, heating means in thermal communication with said bed, means for rotating said chamber about said axis to cause the particles to centrifugally gravitate toward said perforated peripheral wall and means for selectively initiating a flow of combustible fuel in a gaseous agent stream into said chamber through said peripheral perforated wall, said gaseous agent stream fluidizing said bed particles and said fuel reacting with said gaseous agent in said chamber, said method comprising the steps of:

(a) slowly rotating said chamber at a speed sufficient to cause tumbling and mixing of said bed particles but insufficient to cause centrifugal gravitation toward said peripheral wall prior to initiating the flow of said gaseous agent stream; and

(b) applying thermal energy to said tumbling particles to heat said particles to said ignition temperature.

4,288,216

CALCINER WITH TAPERED REVERSE FEED SPIRAL

James N. Christini; Tai K. Kim, both of Towanda, and Robert P. McClintic, Monroeton, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

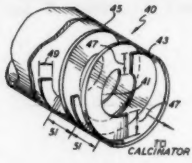
Filed Apr. 24, 1980, Ser. No. 143,236

Int. Cl.³ F27B *6/08*; F27D *3/00*

U.S. Cl. 432—112 **10 Claims**

1. A reverse pitch tapered spiral for a refractory metal reclaiming calciner having a cylindrical rotatable retort of a given inner diameter with a material-receiving end and a material-discharging end separated by a hot zone and coupled to a motor drive for rotating the retort in a given direction to

provide material flow in a given direction, said reverse pitch tapered spiral characterized by the improvement wherein a spiral having a reverse pitch with respect to said given direction of material flow is positionally located in said material-dis-



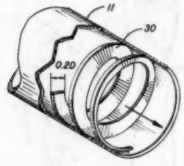
charging end of said rotatable retort and tapers toward the material exit from said material-discharging end whereby the direction of material flow within said material discharge end is reversed with respect to material flow within said material-receiving end and hot zone of said rotatable retort.

4,288,217

ROTARY CALCINER FEED SPIRAL

James N. Christini; Tai K. Kim, both of Towanda, and Robert P. McClintic, Monroeton, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 28, 1980, Ser. No. 144,126
Int. Cl.³ F27B *6/08*; F27D *3/00*
U.S. Cl. 432—112 **12 Claims**



1. A material feed spiral for a refractory metal reclaiming calciner having a cylindrical rotatable retort of a given inner diameter with a material receiving end and a material discharging end separated by a hot zone and coupled to a motor drive source, said material feed spiral characterized by the improvement comprising a spiral having a final turn and a ¾-turn rotated 180° therefrom and ending adjacent said material-receiving end of said rotatable retort and a next to final turn connected to and extending outwardly from said final turn and away from said material-receiving end of said rotatable retort, said final turn and said ¾-turn having a height substantially equal to a given percentage of the inner diameter of said cylindrical retort and said next to final turn tapering from said height of a given percentage of said inner diameter of said cylindrical retort to a height less than said given percentage of said inner diameter of said cylindrical retort whereby undesired "feedback" into the material feed spiral is inhibited.

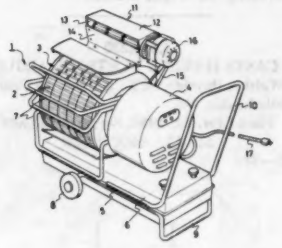
4,288,218

HEATING APPARATUS

Akio Obinata, Suzaka, Japan, assignor to Orion Machinery Co., Ltd., Nagano, Japan

Filed Nov. 19, 1979, Ser. No. 95,237
Int. Cl.³ F24H *1/00*
U.S. Cl. 432—222 **9 Claims**

1. A heating apparatus comprising a combustion chamber including a generally cylindrical housing, a radiator forming a part of the exterior of said housing and having a radiating surface which extends over the axial length of said chamber for directing radiant heat in a forward heating direction transverse to the axis of said chamber so that an object located away from said chamber in the forward heating direction is directly heated by radiation, casing means on the exterior of said housing for reducing heat radiation from said radiator in directions other than the forward heating direction, fan means including an elongated case which forms an outlet opening substantially coextensive with said radiating surface in the axial direction of said chamber for deflecting convective air which rises above the exterior of said chamber in said forward direction, said case



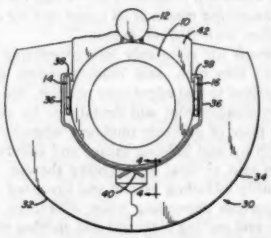
being mounted to said casing means above said chamber on the rear side of said chamber facing opposite said heating direction so that said fan means is out of the influence of radiant and convective heat developed by said chamber, said outlet opening facing in the same direction as said forward heating direction, and a motor mounted at one end of said fan means for driving said fan means so that said motor is out of the influence of said radiant and convective heat.

4,288,219

REFRACTORY INSULATED MEMBER AND METHOD OF INSTALLATION THEREOF IN A REHEAT FURNACE

John Gana, Doylestown, Pa., and Dwight L. Torlay, Lawrenceville, N.J., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jun. 18, 1979, Ser. No. 49,758
Int. Cl.³ F27D *1/12*
U.S. Cl. 432—234 **2 Claims**



1. In a horizontal work support member for a reheat furnace, said member including an elongated metal pipe, a refractory barrier comprising a plurality of mateable pairs of sections for covering at least a portion of the periphery of said pipe, support means for said sections secured exteriorly on each of two opposite sides of an upper half of the cross section of said pipe, each barrier section having a metal hanger secured to and extending along the inner surface thereof from an upper end engageable with said support means to a lower end connectable to the corresponding lower end of the hanger means of the opposite section in the pair,

the improvement in said member which comprises:

said support means being a plurality of elongated metal bars secured lengthwise in prescribed position on the periphery of said pipe on each of said opposite sides thereof,

said bars being aligned mateably in close adjoining end-to-end relation and of substantially solid cross section,

said bars facing upwardly and having a portion of the cross section thereof remote from the pipe periphery extending therefrom a uniform distance along the length of said pipe,

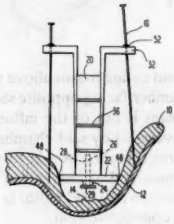
the upper end of said hanger means having a fixed shape substantially conforming to the shape of said remote portion of the bars protruding from said pipe so as to fit closely over the outer periphery of said bars at any desired location along the length thereof.

4,288,220

DENTAL CASTS HAVING VERTICAL ADJUSTMENTS

Robert W. Waltke, Bayside, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 31, 1980, Ser. No. 135,805
Int. Cl.³ A61C *19/00*
U.S. Cl. 433—74 **10 Claims**



1. Apparatus for preparing a dental cast from a negative dental impression, said cast having a detachable vertically adjustable edentulous portion replicating an edentulous area of said impression, said apparatus comprising

pin means insertable in said impression adjacent said edentulous area,

a stanchion assembly articulating with said pin means and positionable above said edentulous area in spaced relationship thereto, said stanchion assembly comprising

a parting plate of substantially identical size and shape as said edentulous area,

an upright stanchion positioned above said parting plate and having mounting means at its upper end for effecting said articulation with said pin means,

holding means for releasably interconnecting said parting plate and stanchion, said holding means being permanently affixed to said edentulous portion, said parting plate being removable from said dental cast for substitution by another plate of different thickness whereby engagement therewith by said holding means and edentulous portion provides said vertical adjustability thereto, said vertical adjustability including raising and lowering of said edentulous portion depending upon difference in thickness between said parting plate and said another plate of different thickness.

4,288,221

DURABLE, POLISHABLE DIRECT FILLING MATERIAL

Michael R. Engel, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 28, 1980, Ser. No. 115,741
Int. Cl.³ A61C *13/08;* C08L *77/00*
U.S. Cl. 433—202 **15 Claims**

1. A composite dental restorative composition, comprising a blend of:

(A) free radically polymerizable resin comprising at least one acrylic monomer; and

(B) finely divided organic filler particles, said filler having a Izod milled notch strength of at least about 1 joule/cm and a flexural strength of at least about 34 Mpa;

which composition in reactive association with a free radical generating catalyst will cure into a direct filling material.

11. An artificial tooth made from a composition according to claim 1.

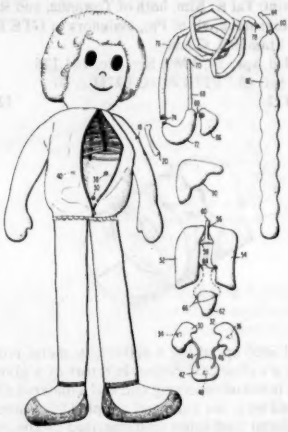
12. A denture base made from a composition according to claim 1.

4,288,222

DOLL WITH REMOVABLE ORGANS

Jane A. Kling, 818 S. Wolcott, 401 S.R.H., Chicago, Ill. 60622

Filed Feb. 19, 1980, Ser. No. 122,892
Int. Cl.³ G09B *23/34*
U.S. Cl. 434—272 **2 Claims**



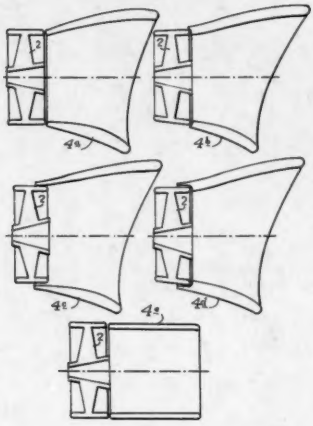
1. A doll comprising a soft, pliable hollow body portion, a head, arms and legs secured to said doll, a closeable aperture in said body portion for providing access to the interior thereof, a simulated rib cage constructed from elongated malleable elements interconnected with each other located within said hollow body portion, a plurality of soft, pliable simulated body organs detachably connected to each other and the interior of said hollow body portion in the proper location relative to each other including a heart, lungs, a stomach, a spline, a liver, kidneys, and a bladder, said kidneys being connected to said bladder by simulated ureter tubes of cloth material with said kidneys and bladder being detachably connected to the wall of said hollow body portion, said heart being detachably connected to said lungs and said lungs being connected to each other by simulated bronchea tubes of cloth material which in turn are connected to a simulated trachea tube of cloth material detachably connected to the interior of said hollow body portion, and said spleen being detachably connected to said stomach which in turn is detachably connected to the interior of said hollow body portion through a simulated esophagus tube of cloth material and further comprising a simulated small intestinal tube of flexible cloth material detachably connected at one end to said stomach and a simulated colon of flexible cloth material being detachably connected at one end to the other end of said small intestinal tube.

4,288,223

TUBULAR DUCT FOR A SHIP PROPELLER

Ramon R. Gonzalez, and Gonzalo P. Gomez, both of Madrid, Spain, assignors to Astilleros Espanoles, S.A., Madrid, Spain

Filed Feb. 8, 1980, Ser. No. 119,609
Claims priority, application Spain, Nov. 2, 1979, 485.667
Int. Cl.³ B63H 1/14, 5/06
U.S. Cl. 440—71 12 Claims



1. A combination of a ship propeller in juxtaposition with a non-rotating tubular duct,

the propeller having an axis, a diameter and a plurality of blades, each blade having (a) a tip radius, (b) a fixed plate and (c) a back or suction side,

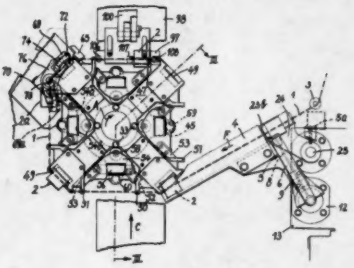
the tubular duct (d) being coaxial with and displaced from said propeller and on the back or suction side thereof, (e) effectively comprising means to extend a geometric figure generated (by a cross-section of an axial plane, through the tip radius of a blade, with the fixed plate) on rotation of said fixed plate about the axis, (f) having an internal radius at a point adjacent to the fixed plate which is approximately that of the geometric figure at a point which is closest to said duct, (g) providing means to direct fluid toward said back or suction side of said propeller and (h) having a length at its shortest point which is at least 20 percent and at most 2 times that of the diameter.

4,288,224

APPARATUS FOR SECURING A SUSPENSION THREAD TO FILTER BAGS FOR INFUSION PRODUCTS

Andrea Romagnoli, Bologna, Italy, assignor to IMA - Industria Macchine Automatiche S.p.A., Ozzano Emilia, Italy

Filed Jun. 25, 1979, Ser. No. 51,655
Claims priority, application Italy, Mar. 6, 1979, 3341 A/79
Int. Cl.³ B31B 1/90
U.S. Cl. 493—345 5 Claims



1. An apparatus for applying tags to a web of a filter material adapted to form filter bags in the production of infusion products, said apparatus comprising:

a support;

a rotatable member journaled on said support for rotation about a horizontal axis, said member having a plurality of angularly spaced arms lying substantially in a vertical plane, each of said arms being formed at an extremity with a pocket for receiving a respective tag, and a pair of string clamps flanking said pocket;

guide means for directing a string toward said member from a supply spaced therefrom;

feed means for advancing a succession of folded tags to said guide means and provided with means for fixing said tags at spaced locations to said string with sections of said tags straddling the string, said tags on said string being received in succession in respective pockets of said of said arms upon rotation of said member with the string on either side of said member being engaged in the respective clamps at a receiving station along the path of said arms;

means for guiding said web in a substantially vertical plane across said member, said arms successively arriving at a further station angularly spaced from said receiving station about said axis;

a cutting station disposed between said receiving station and said further station along the path of said arms on rotation of said member provided with means for cutting said string between tags engaged by respective arms whereby a free end of a string is formed at upstream and downstream sides of each tag;

means for looping an upstream free end of a string between a tag at said further station and said web; and

means at said further station for bonding a string of each tag to said web at three locations including two locations respectively on an upstream and a downstream side of each tag.

4,288,225

FLUID, COLD-STABLE, TWO-COMPONENT WASHING COMPOSITIONS AND METHOD OF WASHING TEXTILES

Wolf-Achim Roland, Hilden, and Wolfgang Bechstedt, Langenfeld, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthaasen, Fed. Rep. of Germany

Filed Aug. 4, 1980, Ser. No. 174,560

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933579

Int. Cl.[3] C11D *9/34, 10/04, 10/06, 17/08*

U.S. Cl. 8—137 12 Claims

1. A method of washing soiled textiles consisting of the steps of adding a washing agent consisting of two components, A and B, wherein conponent A is an aqueous dispersion of fatty acids consisting essentially of

(a) from 15% to 35% by weight of a C_{12-18} fatty acid having from 60% to 100% of the fatty acids of oleic acid,

(b) from 2% to 6% by weight of potassium hydroxide and from 2% to 6% by weight of triethanolamine, where the total amount is such that from 50% to 95% by weight of the fatty acids are present as a potassium or triethanolamine soap,

(c) from 4% to 10% by weight of an ethoxylate of from 5 to 12 ethoxylate units onto a primary alcohol selected from the group consisting of linear C_{8-14} alkanols and C_{8-14}-2-methylated-alkanols,

(d) from 4% to 10% by weight of a sodium C_{10-14}-alkylbenzenesulfonate,

(e) from 0.05% to 1% by weight of an alkali metal salt of substituted stilbenesulfonic acid optical brighteners,

(f) from 5% to 15% by weight of alcohols selected from the group consisting of C_{1-3}-alkanols and mixtures of C_{1-3}-alkanols with up to 50% by weight of the mixture of C_{1-4}-alkoxy-C_{2-3}-alkanols or C_{1-4}-alkoxy-C_{2-3}-alkoxy-C_{2-3}-alkanols, and

(g) from 35% to 50% by weight of water, and component B is an aqueous solution of alkalies consisting essentially of

(h) from 2% to 7% by weight of sodium tripolyphosphate and from 2% to 7% by weight of potassium tripolyphosphate, where the total amount is from 5% to 12% by weight,

(i) from 0.5% to 4% by weight of 1-hydroxyethane-1,1-diphosphonic acid in the form of the sodium or potassium salt,

(j) from 10% to 20% by weight of potassium hydroxide and from 0 to 5% by weight of sodium hydroxide, where the total amount of alkali metal hydroxide is from 10% to 20% by weight,

(k) from 0.5% to 3.5% by weight of an alkali metal silicate of the composition $Me_2O:SiO_2$=1:1 to 1:3.5 where Me is sodium or potassium,

(l) from 0 to 2.5% by weight of a sequestering agent selected from the group consisting of alkali metal salts of polyaminopolycarboxylic acids and alkali metal salts of polyaminopolyphosphonic acids, and

(m) from 50% to 70% by weight of water, where the ratio of component A to component B in the combination for washing is from 1:1 to 1:4; and where the washing liquor has a pH of from 9 to 14;

to an aqueous wash liquor containing soiled textiles in such amounts that the total amount of all active washing ingredients including wash alkalies is from 2 gm to 8 gm per liter of wash liquor, agitating said textiles in said wash liquor, draining and rinsing said textiles and recovering clean textiles, where the water employed has a German hardness degree of less than 10 °dH and the wash:liquor ratio is from 1:4 to 1:8.

4,288,226

PROCESS FOR SLOP-PADDING TEXTILE CELLULOSE MATERIAL

Heinz Abel, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 20, 1979, Ser. No. 77,421

Claims priority, application Switzerland, Nov. 8, 1978, 11481/78

Int. Cl.[3] D06P *1/38, 1/56, 3/60*

U.S. Cl. 8—496 26 Claims

1. A process for slop-padding textile cellulose material with an anionic substantive dye, which comprises applying to said material an aqueous liquor which, in addition to the dye, contains

(A) 2.5 to 15 g/l of an etherified N-methylolmelamine,

(B) an acid catalyst and at least one of the components

(C) an anionic surfactant,

(D) a non-ionic surfactant and

(E) an organic solvent which boils above 140° C., and subsequently subjecting the material to a heat treatment.

4,288,227

BASIC PHENOXAZINE DYESTUFFS

Berthold Gertisser, Münchenstein, and Beat Henzi, Neuallschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

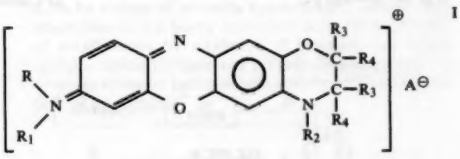
Continuation-in-part of Ser. No. 837,902, Sep. 29, 1977, abandoned. This application May 16, 1979, Ser. No. 39,646

Claims priority, application Switzerland, Oct. 1, 1976, 12452/76

Int. Cl.[3] C09B *19/00;* D06P *1/00, 1/52, 3/24*

U.S. Cl. 8—655 29 Claims

1. A colouration process for a substrate comprising or consisting of homo- and co-polymers of acrylonitrile or of dicyanoethylene, or acid modified synthetic polyamide or polyester, which process comprises mass dyeing, dyeing or printing such substrate, employing a dyestuff or mixture of dyestuffs of formula I,



I

wherein either

R is hydrogen, or a straight or branched chain C_{1-8}alkyl radical, unsubstituted or mono-substituted by OH, CN, Cl, Br, $CONH_2$, C_{1-4}-alkoxy, phenyl, phenoxy, —O—CO—R_5 or —CO—O—R_5,

and R_1 is a straight or branched chain C_{1-8}alkyl radical, unsubstituted or mono-substituted by OH, CN, Cl, Br, —$CONH_2$, C_{1-4}alkoxy, phenyl, phenoxy, —O—CO—R_5 or —CO—O—R_5; or phenyl, unsubstituted or monosubstituted by halogen, C_{1-4}alkyl or C_{1-4}alkoxy,

or R and R_1, together with the nitrogen atom to which they are attached, form a morpholine, piperidine, pyrrolidine, piperazine or N—C_{1-4}alkyl-piperazine ring,

R_2 is hydrogen or a straight or branched chain C_{1-8}alkyl radical, unsubstituted or mono-substituted by OH, CN, Cl, Br, —$CONH_2$ or —$COOR_5$,

each R_3, independently, is hydrogen or unsubstituted C_{1-4}alkyl,

each R_4, independently, is hydrogen, unsubstituted C_{1-4}alkyl or unsubstituted phenyl,

R_5 is unsubstituted C_{1-4}alkyl or unsubstituted phenyl, and

$A^{\ominus}$ is an anion,

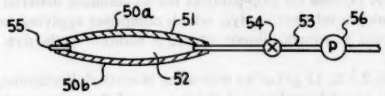
with the proviso that any substituted alkyl as R, R_1 or R_2 is of at least 2 carbon atoms.

4,288,228

WHOLE BLOOD ANALYSES AND DIFFUSION APPARATUS THEREFOR

Bruce J. Oberhardt, Katonah, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jan. 31, 1979, Ser. No. 7,858
Int. Cl.³ G01N *31/06, 33/52*
U.S. Cl. 23—230 R **31 Claims**



29. A method of performing a reaction with an analyte of a sample, comprising the steps of:

(a) diffusing said analyte into a first porous medium;

(b) contacting said first porous medium with a second porous medium to allow diffusion of said analyte into said second porous medium, said second porous medium having at least one first reagent for reaction with said analyte; and

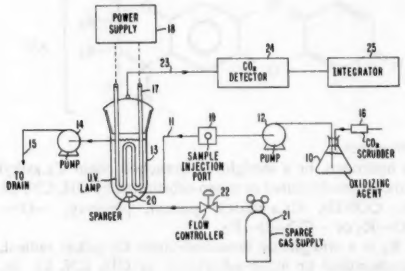
(c) contacting said second porous medium with a third porous medium containing at least one second reagent, said contacting of at least two of said porous media comprising the displacement of a liquid from between said two media.

4,288,229

DETERMINATION OF TOTAL ORGANIC CARBON IN A PLURALITY OF AQUEOUS SAMPLES CONTAINING HALIDE ION

Danny M. Mar, Daly City, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 128,066, Mar. 7, 1980. This application Apr. 21, 1980, Ser. No. 142,577
Int. Cl.³ G01N *33/18, 31/12*
U.S. Cl. 23—230 PC **23 Claims**



1. A process for determining total organic carbon in each one of a plurality of discrete aqueous samples containing halide ion, said process comprising the steps of:

(a) maintaining a continuous flow via a flowline into a reactor of an aqueous solution that contains an oxidizing agent and mercuric monohalide ion without forming an insoluble precipitate;

(b) introducing said samples in succession into said reactor;

(c) irradiating said solution and each sample in said reactor with electromagnetic energy, said electromagnetic energy emanating from a source immersed in said aqueous solution inside said reactor, thereby causing oxidation of organic carbon in each sample;

(d) causing carbon dioxide produced by oxidation of said organic carbon in each sample to be removed from said reactor; and

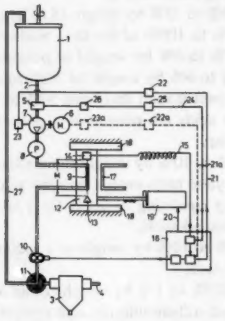
(e) passing the carbon dioxide removed from said reactor to a means for measuring total carbon in said carbon dioxide for each sample.

4,288,230

METHOD AND A DEVICE FOR THE PRODUCTION OF A SOLID-FORMING OR FOAM-FORMING FLOWABLE REACTION MIXTURE

Wilfried Ebeling, Cologne, and Volkmar Tennemann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 6, 1980, Ser. No. 175,818
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933327
Int. Cl.³ G01N *23/14;* B29D *27/02*
U.S. Cl. 23—230 A **11 Claims**



1. A method for the production of a solidforming of foam-forming flowable reaction mixture from at least two flowable components reacting with each other, which are fed continuously to a mixing zone and mixed together, wherein the volumetric rate of flow of at least one component is measured and its density determined, characterized in that the density of the component is measured by radiometry under high pressure and under low pressure in succession,

(a) the quantitative rate of flow of the component being determined from the measurement under high pressure as a product of the density and of the measured volumetric rate of flow, and the quantitative rate of flow being controlled by comparison with a predetermined set value and,

(b) the measurement of the density under low pressure serving as a gauge for the gas charge and the quantity of gas necessary being controlled so as to maintain a predetermined set value by comparison of the difference between the two measured density values.

4,288,231

COAL TREATMENT PROCESS

David W. Taylor, Edgemont, Pa., assignor to Microfuels, Inc., Haverford, Pa.

Filed Nov. 13, 1979, Ser. No. 93,870
Int. Cl.³ C10L *9/00, 9/08;* B02C *19/06*
U.S. Cl. 44—1 SR **22 Claims**

1. An apparatus for treating coal to reduce the level of ash-forming impurities contained therein comprising, in combination:

a substantially air tight grinding mill for reducing said coal to particles comprising a hydrophobic coal-fraction and a hydrophilic impurities-fractions, a major portion of said particles having a size less than about 40 microns, injector means for introducing an air-free fluid carrier medium into said mill, inlet means for introducing raw coal into said carrier medium, and outlet means for withdrawing from said mill at least a portion of said coal-fraction and impurities-fraction entrained in said carrier medium;

a feed conduit for supplying raw coal to said mill for size

reduction said conduit having means for excluding air from said conduit and said mill;

means for cooling said withdrawn coal-fraction and impurities-fraction thereby causing wetting of the particles constituting the impurities fraction, but leaving the particles constituting the coal-fraction substantially dry;

a separator for separating said hydrophobic coal-fraction from said wetted impurities-fraction; and

means for transferring said carrier medium with said unagglomerated coal-fraction and said impurities-fraction entrained therein from said mill to said separator.

15. A process for treating coal to reduce the level of ash-forming impurities contained therein comprising:

a. grinding raw coal to a particle size of less than about 40 microns in a substantially air free environment to form a hydrophobic coal fraction and a hydrophilic impurities fraction;

b. contacting said fractions with an aqueous liquid whereby the particles constituting the impurities fraction are wetted, but the particles constituting the coal fraction are left substantially dry;

c. separating the impurities particles from the coal particles.

4,288,232

ESTER CONTAINING FUEL COMPOSITION

Irving R. Schmolka, Grosse Ile, and Joseph H. Y. Niu, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 19, 1979, Ser. No. 105,424
Int. Cl.³ C10L *1/32*
U.S. Cl. 44—51 **11 Claims**

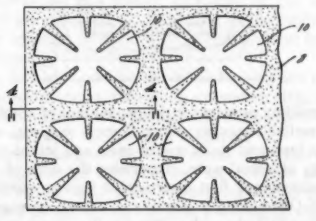
1. A combustible fuel slurry comprising solid particulate carbonaceous material, liquid hydrocarbon fuel, and a minor slurry suspension stabilizing amount of a fatty acid ester of a polyoxyalkylene polymer wherein said fatty acid has about 12 to 22 carbon atoms in the acyl group, the lyoxyalkylene groups have a total molecular weight of abou. 500 to 2000 and said polyoxyalkylene polymer is selected from the group consisting of polyoxypropylene polymers and polyoxyethylene-polyoxypropylene copolymers containing up to about 60 percent by weight polyoxyethylene groups.

4,288,233

ABRASIVE PADS FOR LENS LAPPING TOOLS

Ronald C. Wiand, 1790 Washington, Birmingham, Mich. 48009

Continuation of Ser. No. 872,334, Jan. 25, 1978, abandoned. This application Aug. 2, 1979, Ser. No. 63,104
Int. Cl.³ B24D *11/00*
U.S. Cl. 51—295 **10 Claims**



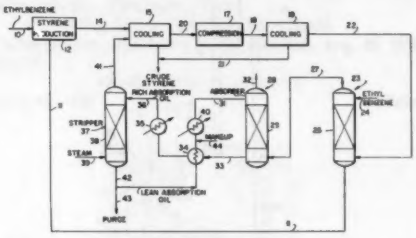
1. A method of making an abrasive pad for an ophthalmic lens lapping tool comprising first metal plating diamond particles to a substrate sheet and then cutting shapes from said sheet, said shapes being conformable to the surface of said lens lapping tool.

4,288,234

RECOVERY OF AROMATICS FROM STYRENE PRODUCTION OFF-GAS

Robert P. Cox, Wyckoff, N.J., and Norbert R. Tarradellas, Basrah, Iraq, assignors to The Lummus Company, Bloomfield, N.J.

Filed Nov. 15, 1979, Ser. No. 94,672
Int. Cl.³ B01D *47/00*
U.S. Cl. 55—48 **5 Claims**



1. In a process for treating an off-gas generated in a process for producing styrene from ethylbenzene, said off-gas containing hydrogen and aromatic hydrocarbons, the improvement comprising:

finally treating the off-gas, which comprises hydrogen ethylbenzene and a member selected from the group consisting of styrene, benzene, toluene and mixtures thereof, and which contains from 0.5% to 10% by volume of aromatic hydrocarbons by contacting the off-gas at a temperature of from 35° F. to 125° F. and a pressure of from 15 to 100 psia with an absorption oil for aromatics having a 5-volume percent distillation temperature of at least 400° F. to absorb aromatic hydrocarbons present in the off-gas and provide a remaining off-gas essentially free of aromatic hydrocarbons, which off-gas contains less than 0.2% by volume of aromatic hydrocarbons, wherein said absorption oil is a heavy byproduct from the production of ethylbenzene by alkylation of benzene, and which contains diphenylethane and polyethylbenzenes; and recovering aromatic hydrocarbons absorbed by said absorption oil by stripping.

4,288,235

LOW RESIDENCE TIME SOLID-GAS SEPARATION DEVICE AND SYSTEM

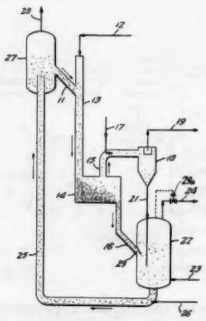
Robert J. Gartside, Auburndale, Mass., and Herman N. Woebcke, Stamford, Conn., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Jul. 6, 1979, Ser. No. 55,148
Int. Cl.³ B01D *45/06, 50/00*
U.S. Cl. 55—196 **14 Claims**

1. A solids-gas separator designed to effect rapid removal of particulate solids from a dilute mixed phase stream of solids and gas, the separator comprising a chamber for disengaging solids from the incoming mixed phase stream, said chamber having rectilinear longitudinal walls to form a flow path essentially rectangular in cross section, said chamber also having a mixed phase inlet, a gas phase outlet, and a solids phase outlet, with the mixed phase inlet being at one end of the chamber and disposed normal to one wall of the rectilinear chamber, said solids phase outlet being at the other end of the chamber and suitably arranged for downflow of discharged solids by gravity, and said gas phase outlet being therebetween and oriented to effect a 180° change in direction of the gas, and wherein said separator further comprises a weir disposed in said chamber and extending across said flow path adjacent said gas phase outlet upstream of said solids phase outlet.

2. A solids-gas separator designed to effect rapid removal of particulate solids from a dilute mixed phase stream of solids

and gas, the separator comprising a chamber for disengaging solids from the incoming mixed phase stream, said chamber having slightly arcuate longitudinal walls to form a flow path essentially rectangular in cross section, said chamber also having a mixed phase inlet, a gas phase outlet, and a solids phase outlet, with the mixed phase inlet being at one end of the chamber and disposed normal to one wall of the rectilinear



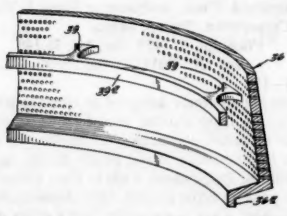
chamber, and the solids phase outlet being at the other end of the chamber and suitably arranged for downflow of discharged solids by gravity, and said gas phase outlet being therebetween and oriented to effect a 180° change in direction of the gas, and wherein said separator further comprises a weir disposed in said chamber and extending across said flow path adjacent said gas phase outlet upstream of said solids phase outlet.

4,288,236

GLASS FIBERIZATION BY CENTRIFUGAL FEED OF GLASS INTO ATTENUATING BLAST

Jean A. Battigelli, and Francois Bouquet, both of Rantigny, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Division of Ser. No. 27,617, Apr. 6, 1979, Pat. No. 4,203,745.
This application Nov. 6, 1979, Ser. No. 91,792
Claims priority, application France, Dec. 8, 1978, 78 34616
Int. Cl.³ C03B *37/04*
U.S. Cl. 65—14 **5 Claims**



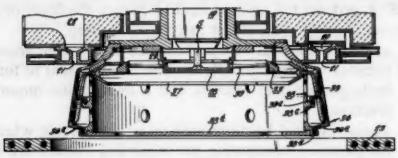
1. Glass fiberizing equipment comprising a hollow spinner arranged on an upright axis and having a peripheral wall having an area perforated with a plurality of rows of orifices for centrifugal projection of streams of molten glass and a blower generating an annular gas current downwardly around the spinner, characterized by the provision of a wall bracing structure positioned inside of the spinner and having means connecting the bracing structure with the mid region of the perforated area of the peripheral wall at circumferentially spaced points.

4,288,237

GLASS FIBERIZATION SPINNER

Jean A. Battigelli; Francois Bouquet, both of Rantigny, and Igor Fezenko, Aubervilliers, all of France, assignors to Saint-Gobain Industries, Cedex, France

Division of Ser. No. 28,393, Apr. 9, 1979, Pat. No. 4,203,748.
This application Nov. 6, 1979, Ser. No. 91,794
Claims priority, application France, Dec. 8, 1978, 78 34616
Int. Cl.³ C03B *37/04*
U.S. Cl. 65—14 **3 Claims**



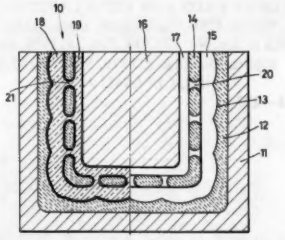
1. Glass fiberizing equipment comprising a hollow spinner having a peripheral wall open at one edge and having mounting means at the other edge, the wall being provided with a plurality of rows of orifices for centrifugal projection of streams of molten glass, characterized in that an annular reinforcement element is integrally connected with the spinner throughout the entire circumference of the open edge of the peripheral wall of the spinner, said element being offset radially inwardly from the open edge of the peripheral wall, and said element having a sectional dimension in a direction axially of the spinner which dimension is greater than the wall thickness of said peripheral wall.

4,288,238

PROCESS AND MOULD FOR THE MANUFACTURE OF MULTI-WALLED HOLLOW BODIES, ESPECIALLY OF GLASS

Kristian Klepsch, Viechtach, Fed. Rep. of Germany, assignor to Klepsch Kunst GmbH & Co. KG Galerie, Viechtach, Fed. Rep. of Germany

Filed Jan. 8, 1980, Ser. No. 110,315
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1979, 2900429
Int. Cl.³ C03B *11/10*
U.S. Cl. 65—23 **15 Claims**



1. A molding process for the production of a hollow vessel from a meltable casting material such as glass, said vessel having at least two walls spaced apart and joined together by a plurality of lateral webs, comprising the steps of:

(a) positioning a first destructable hollow auxiliary mode form (**14**) having a plurality of lateral passages (**20**) extending therethrough within a hollow outer mold (**11**) but spaced therefrom to define an outer wall chamber (**15**) therebetween,

(b) introducing said casting material into said outer wall chamber, said lateral passages, and over the inner surface of said auxiliary mold form,

(c) hardening said casting material to define a unitary hollow vessel having an outer wall (**18**) and an inner wall (**19**) spaced therefrom but connected thereto by a plurality of webs (**21**) formed within said lateral passages, and

(d) chemically dissolving said auxiliary mold form.

13. A mold assembly for the production of a hollow vessel from a meltable casting material such as glass, said vessel having at least two walls spaced apart and joined together by a plurality of lateral webs, comprising:

(a) a rigid hollow outer mold (**11**),

(b) a first destructable hollow auxiliary mold form (**12**) disposed within the outer mold and in intimate contact therewith throughout, and

(c) a second destructable hollow auxiliary mold form (**14**) disposed within said first auxiliary mold form but spaced therefrom to define an outer wall chamber therebetween,

(d) said second auxiliary mold form having a plurality of lateral passages extending therethrough.

4,288,239

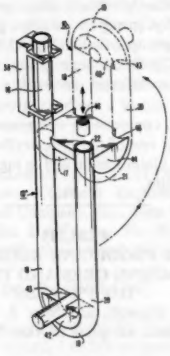
METHOD OF MAKING A CONVOLUTED TUBULAR ENVELOPE FOR A COMPACT ELECTRIC DISCHARGE LAMP

Frederick W. Hoeh, deceased, late of Livingston, N.J. by Inga Hoeh, executrix, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 11,836, Feb. 13, 1979, abandoned. This application Feb. 29, 1980, Ser. No. 126,098

Int. Cl.³ C03B *23/06*

U.S. Cl. 65—110 **7 Claims**



1. In the manufacture of an electric lamp, the method of forming an envelope of compact triple-U-bent configuration from vitreous tubing that is substantially straight, which method comprises the steps of;

heating a predetermined length of such substantially straight vitreous tubing in a manner such that the end segments thereof are rigid and the remainder of the tubing is uniformly softened sufficiently to be bent without fracturing or collapsing,

gripping the rigid end segments of said tubing and swinging them toward one another along a common plane until the heat-softened medial portion of the tubing is bent through an arc such that the tubing is U-shaped,

immediately placing heated mold means of arcuate configuration against the heat-softened leg portions of the U-shaped tubing and, while maintaining the gripped end segments of the tubing stationary, swinging the U-bent medial part of the tubing through an arc of approximately 180° along a path which is substantially normal to the plane of the first bending operation and thereby simultaneously bending both of the heat-softened leg portions around said mold means and forming two additional U-bends in the tubing which are aligned with one another and position the neck of the first-formed U-bend proximate the gripped end segments of the tubing, and then removing said mold means and cooling the resulting triple-U-bent tubular envelope to rigidify and set the vitreous tubing in such configuration.

4,288,240

PLUNGER MOUNTING MECHANISM IN A GLASSWARE FORMING MACHINE

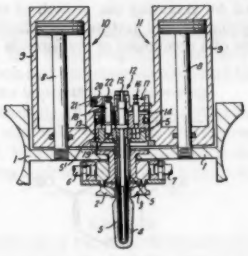
David Braithwaite, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Aug. 6, 1980, Ser. No. 175,614

Claims priority, application United Kingdom, Aug. 29, 1979, 29860/79

Int. Cl.³ C03B *11/05, 11/16*

U.S. Cl. 65—246 **7 Claims**



1. A glassware forming machine comprising at least one upwardly open parison mould in which parisons are formed from molten glass at a blank station, a carriage, and, supported on the carriage, a neck ring, a plunger, and means for moving the plunger between a raised inoperative position and a lowered operative position, the carriage being reciprocable between a first position at which the neck ring engages a parison formed in the parison mould and a second position at which the neck ring opens to release the parison at a further station of the machine, and the plunger being moved to the lowered operative position when the carriage is in the first position so that the plunger projects through the neck ring into the parison mould to form a parison from a gob of molten glass at the blank station.

4,288,241

METHOD AND APPARATUS FOR COMPOSTING SLUDGE

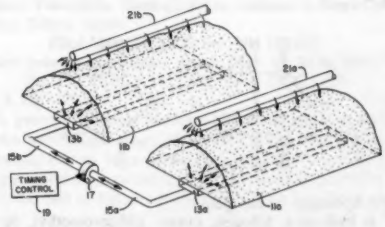
Gedaliahu Shelef, 9 Ayalon St., Haifi, Israel

Filed Jul. 26, 1979, Ser. No. 60,989

Claims priority, application Brazil, Aug. 22, 1978, PI7805441

Int. Cl.³ C05F *11/08*

U.S. Cl. 71—9 **2 Claims**



1. A method of composting sludge comprising arranging the sludge into first and second windrows extending lengthwise

over first and second elongated, perforated conduits, respectively, drawing air from said first windrow into said first perforated conduit and forcing the air drawn from said first windrow into said second windrow through said second conduit in spaced time intervals and in alternate intervals drawing the air from the second windrow into the second conduit and forcing the air drawn from said second windrow into said first windrow through said first conduit.

4,288,242

ALPHA-CHLORO-ALKOXYMETHYL-N-(2,6-DIALKOXYPHENYL)ACETAMIDES AS EFFECTIVE TURFGRASS REGULANTS

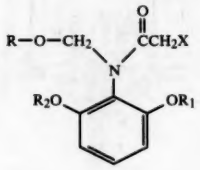
Gerhard H. Alt, University City, and John P. Chupp, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 25, 1980, Ser. No. 133,762

Int. Cl.³ A01N *37/24*

U.S. Cl. 71—76 **9 Claims**

1. A method for retarding the growth of turfgrass which comprises applying to said turfgrass an effective growth retarding amount of a compound of the formula



wherein R, R_1 and R_2 are independently lower alkyl and X is chloro, bromo or iodo.

4,288,243

2',5'-DIOXO-1'-PYRROLYDINYL 5-(2-HALO-4-TRIFLUOROMETHYLPHENOXY)-2-HALO-, CYANO- OR NITROBENZOATES

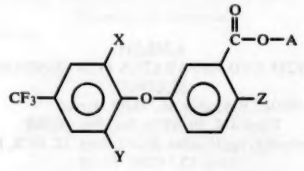
William S. Grove, Doylestown, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 7, 1980, Ser. No. 166,017

Int. Cl.³ A01N *43/36, 43/38*; C07D *209/48, 207/20*

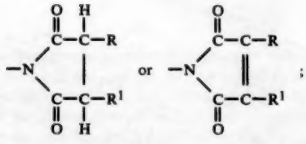
U.S. Cl. 71—95 **9 Claims**

1. A compound represented by the formula:



wherein:

A is



X is hydrogen or halogen;

Y is hydrogen, halogen, cyano, trifluoromethyl, or alkyl containing up to 4 carbon atoms;

Z is nitro, halogen, or cyano; and

R and R^1 are the same or different and represent hydrogen, halogen, or alkyl containing up to 10 carbon atoms, or R and R^1 may join together to form a benzene ring.

8. In a method of controlling weed growth wherein a herbicidally effective amount of herbicide is either applied to the growth medium prior to emergence of the weeds or applied to the weeds subsequent to emergence from the growth medium, wherein the improvement resides in using as the herbicide a herbicidally effective amount of a compound or mixture of compounds defined in claim 1.

4,288,244

N-BENZYLHALOACETAMIDE DERIVATIVES, AND THEIR PRODUCTION AND USE

Osamu Kirino, Ashiya; Shunichi Hashimoto, Sonchigashimachi; Hiroshi Matsumoto, Takarazuka, and Hiromichi Oshio, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

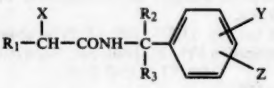
Filed Sep. 14, 1979, Ser. No. 75,705

Claims priority, application Japan, Sep. 19, 1978, 53/115588; Nov. 10, 1978, 53/139069; Nov. 14, 1978, 53/140800

Int. Cl.³ A01N *37/18*; C07C *103/127*

U.S. Cl. 71—118 **13 Claims**

1. A compound of the formula:



wherein R_1 is a C_4–C_7 tertiary alkyl group, X is a halogen atom, R_2 is a methyl group or an ethyl group, R_3 is a methyl group or an ethyl group, or when R_2 and R_3 are taken together, they represent a C_2–C_5 alkylene group, and Y and Z, which may be the same or different, are each a hydrogen, a halogen atom, a methyl group or a methoxy group.

12. A herbicidal composition comprising an inert carrier or diluent and at least one of the N-benzylhaloacetamide derivatives according to claim 1 as an active ingredient in a herbicidally effective amount.

4,288,245

PROCESS FOR PRODUCING AGGLOMERATES OF METAL CONTAINING ORES AND THE PRODUCT OF THE PROCESS

Herm J. Roorda, Rijswijk, and Max J. Jipping, Driebergen, both of Netherlands, assignors to Akzo NV, Arnhem, Netherlands

Filed Nov. 15, 1976, Ser. No. 741,981

Claims priority, application Netherlands, Nov. 20, 1975, 7513554

Int. Cl.³ C22B *1/14*

U.S. Cl. 75—0.5 R **14 Claims**

1. In a process for agglomerating a metal-containing ore material in the presence of water and an alkali metal salt of carboxymethyl cellulose as a binder, the improvement comprising combining as a binder an alkali metal salt of carboxymethyl cellulose in an amount of at least 0.01%, calculated on the weight of the dry ore material, with one or more salts selected from the group consisting of an alkali metal salt of acetic acid, benzoic acid, lactic acid, propionic acid, tartaric acid, succinic acid, citric acid, nitrous acid, boric acid and carbonic acid in an amount of at least 2%, calculated on the weight of the alkali metal salt of carboxymethyl cellulose.

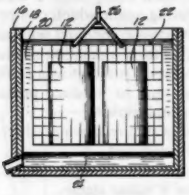
11. The agglomerated product of claim 10 wherein the binder composition is an alkali metal salt of carboxymethyl cellulose in an amount of 0.01–1% by weight and one or more salts derived from an alkali metal and a weak acid with a pK vaslue higher than 3 and a molecular weight lower than 500 in an amount of 0.001–10% by weight, all percentages being calculated on the dry ore material.

4,288,246

SEPARATION OF ALUMINUM FROM ARTICLES COMPOSED OF ALUMINUM BONDED TO FERROUS METAL

Thomas J. Banski, Kenosha, and Robert J. Riedner, Big Bend, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 26, 1979, Ser. No. 106,554
Int. Cl.³ C22B *21/06*
U.S. Cl. 75—68 R 10 Claims



1. A method for separating aluminum from an article composed of an aluminum part bonded to a ferrous metal part, said method comprising the steps of immersing the article in a molten salt bath composed of about 5 to about 10 weight % cryolite, about 5 to about 10 weight % aluminum fluoride and about 80 to about 90 weight % of a mixture of sodium chloride and potassium chloride, having a specific gravity less than that of the aluminum, and maintained at a temperature above the melting point of the aluminum, retaining the article in said bath a sufficient time for substantially all the aluminum to melt, to separate from the ferrous metal part, and to settle in said bath, maintaining the ferrous metal part out of contact with the molten aluminum accumulating in said bath, and removing the resulting substantially aluminum-free ferrous metal part from said bath.

4,288,247

NICKEL-BASE SUPERALLOYS

Stuart W. Shaw, Sutton Coldfield, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Jul. 2, 1979, Ser. No. 54,308
Claims priority, application United Kingdom, Jul. 6, 1978, 28996/78
Int. Cl.³ C22C *19/05*
U.S. Cl. 75—171 7 Claims

1. An alloy consisting essentially of, by weight, 19 to 21% chromium, 5 to 25% cobalt, 1 to 5% tungsten, 0.5 to 3% tantalum, 2 to 5% titanium, 1 to 4.5% aluminum, the sum of the titanium plus aluminum being from 4.5 to 9%, 0 to 2% niobium, 0.35 to 1.2% boron, 0 to 3.5% molybdenum, 0 to 0.5% zirconium, 0 to 0.2% in total of yttrium or lanthanum or both, and 0 to 0.1% carbon, the balance, apart from impurities, being nickel, characterized in that the alloy additionally contains one or both of hafnium in an amount up to 2.2% and vanadium in an amount up to 2.0%.

4,288,248

TEMPERATURE RESISTANT ABRASIVE COMPACT AND METHOD FOR MAKING SAME

Harold P. Bovenkerk, and Paul D. Gigl, both of Worthington, Ohio, assignors to General Electric Company, Worthington, Ohio

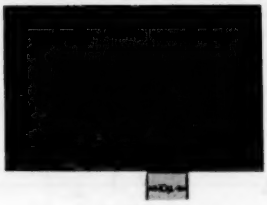
Division of Ser. No. 890,898, Mar. 28, 1978, Pat. No. 4,224,380, which is a continuation of Ser. No. 770,151, Feb. 18, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 960,054
Int. Cl.³ B22F *3/00, 3/24*
U.S. Cl. 75—226 6 Claims

1. A method of making a tool component comprising:

a. placing within a reaction cell a mass of abrasive particles selected from the group consisting of diamond and cubic boron nitride and a mass of sintering aid material for said abrasive particle mass;

b. simultaneously subjecting said cell and the contents to temperatures in the range of 1200° C. and to 2000° C. and pressures in excess of 40 kilobars;

c. ceasing the input of heat to said cell;



d. removing from said cell an abrasive body formed by steps (a) to (c), said body comprising said particles in a self-bonded form and said material infiltrated throughout the particles the improvement comprising:

removing substantially all said material infiltrated in said body by contacting said body with a first hot medium comprising nitric acid and hydrofluoric acid and then a second hot medium comprising hydrochloric acid and nitric acid.

4,288,249

WATER SOLUBLE PENTACHLOROPHENOL AND TETRACHLOROPHENOL WOOD TREATING SYSTEMS

Joseph Amundsen, Federal Way; Robert J. Goodwin, Puyallup, and William H. Wetzel, Federal Way, all of Wash., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Continuation of Ser. No. 14,955, Feb. 26, 1979, abandoned, which is a continuation of Ser. No. 857,035, Dec. 2, 1977, abandoned. This application Aug. 11, 1980, Ser. No. 176,795
Int. Cl.³ C09D *5/14*
U.S. Cl. 106—18.35 4 Claims

1. Water soluble wood treating and preserving solutions consisting of blends of (A) from about 0.1% to about 50% by weight of a chlorophenol selected from a group consisting of pentachlorophenol and tetrachlorophenol and mixtures thereof (B) from about 2% to about 98% by weight aliphatic alcohols selected from the group consisting of N-butyl alcohol, secondary butyl alcohol, isobutyl alcohol, tertiary butyl alcohol and isopropyl alcohol and mixtures thereof (C) from about 0.56% to about 45% by weight of an amine selected from the group consisting of ammonium hydroxide, triethylamine, trimethyl amine, methyl amine and methyldiethanol amine and mixtures thereof and (D) from about 1% to about 97% by weight water.

4,288,250

GLASS FILTER FOR CONTRAST ENHANCEMENT IN CRT DISPLAYS

Toshiharu Yamashita, Hachioji, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Mar. 20, 1980, Ser. No. 132,347
Claims priority, application Japan, Mar. 20, 1979, 54-31785
Int. Cl.³ C03C *3/04;* C07C *3/08;* C03C *3/10*
U.S. Cl. 501—78 6 Claims

1. A green filter glass having a sharp transmission peak in only the wavelength range of 540 to 550 mμ where the peak transmittance is to 10 to 16% through which 2 to 4% light having a wavelength of 610 to 620 mμ passes together with the light in the 540 to 550 mμ transmission peak consisting essentially of:

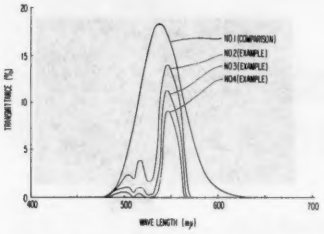
about 0.1 to 1.5 part by weight Cr_2O_3,
about 0 to 0.5 part by weight CuO,
about 0 to 0.2 part by weight NiO and

100 parts by weight of a base glass composition consisting essentially of:

about 4 to 70% by weight SiO_2

about 15 to 30% by weight Nd_2O_3

about 0 to 25% by weight of an alkali metal oxide (R_2O) and



about 0 to 46% by weight of a divalent metal oxide (RO) such that the sum of R_2O and RO is about 10 to 50% by weight

about 0 to 25% by weight B_2O_3

about 0 to 10% Al_2O_3 and

about 0 to 10% by weight of each of TiO_2, ZrO_2, La_2O_3, Nb_2O_5 and Ta_2O_5.

4,288,251

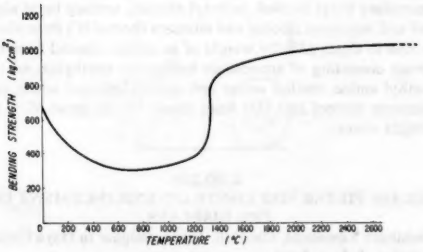
REINFORCED ELECTROCAST ZIRCONIA REFRACTORIES

Toshikatsu Haga; Hiroyuki Fukuda, both of Iwaki; Hiroshi Shinoda, Gifu, and Hideharu Hayakawa, Nagoya, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and NGK Insulators, Ltd., Aichi, both of, Japan

Continuation-in-part of Ser. No. 47,102, Jun. 11, 1979, abandoned. This application Feb. 21, 1980, Ser. No. 123,452

Int. Cl.³ C04B *35/48*

U.S. Cl. 501—105 **2 Claims**



1. A reinforced electrocast zirconia refractory obtained by heating fully stabilized electrocast zirconia refractories containing 89.0 to 97.5% by weight of ZrO_2, less than 1% by weight of SiO_2, less than 1% by weight of Al_2O_3 and 2.5 to 8.0% by weight of a stabilizing agent to a temperature of at least about 1400° C. in an atmosphere containing from 1.5 to 30% volume of oxygen, a raising rate of temperature being less than 85° C./hour during the period from the time when temperature reaches about 600° C. to the time when the temperature reaches about 1400° C., and maintaining said stabilized electrocast zirconia refractory at the temperature of at least about 1400° C. at least for 30 minutes.

4,288,252

METHOD OF MAKING LOW TEMPERATURE CURABLE SILICATE COMPOSITIONS

James E. Neely, Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 973,479, Dec. 26, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 142,492

Int. Cl.³ C09D *1/02*; C09J *1/02*

U.S. Cl. 106—74 **4 Claims**

1. A method for making a waterstable composition from an aqueous silicate solution comprising a water soluble silicate and an inorganic curing agent which comprises the steps of:

a. reacting an ammonia compound with aluminum dihydrogen phosphate to form a reaction product;

b. heating said reaction product at a sufficient temperature for a sufficient time to produce predominantly B-form aluminum trimetaphosphate;

c. combining said heated reaction product with a mixture of alkali metal silicates; and

d. curing at a temperature between 150° C. and 250° C. until the composition is water stable.

4,288,253

WATER INSENSITIVE BONDED PERLITE STRUCTURAL MATERIALS

Joseph M. Venable, New Braunfels, Tex., assignor to Pamrod, Incorporated, McQueeney, Tex.

Continuation of Ser. No. 502,072, Aug. 30, 1974, abandoned. This application Jun. 8, 1979, Ser. No. 46,848

Int. Cl.³ C04B *43/00*

U.S. Cl. 106—84 **10 Claims**

1. An improved water insensitive structural material consisting essentially of reactive expanded perlite bonded by an in situ produced water insoluble, crystalline reaction product of said expanded perlite and at least one alkali metal silicate selected from sodium silicate and potassium silicate, said structural material being made by a process comprising the steps of:

(a) mixing from about 1 to about 2 parts by weight of a filler material having at least 75 parts by weight reactive expanded perlite with about 4 to about 1 parts by weight of an aqueous solution of said at least one alkali metal silicate and when said alkali metal silicate is sodium silicate, the weight ratio of SiO_2 to Na_2O is from about 3:1 to about 4:1 and the solids content is from about 28 to about 34 weight percent and when said alkali metal silicate is potassium silicate, the weight ratio of SiO_2 to K_2O is from about 2:1 to about 2.6:1 and the solids content is from about 24 to about 30 weight percent;

(b) thereafter compressing the mixture from step (a) into a coherent article; and

(c) thereafter subjecting the coherent article from step (b) to a one-stage curing process in which the article is maintained through the entire curing process at a temperature about 180° F. to about 225° F. at a relative humidity of from about 30% to 60%.

4,288,254

PREDISPERSED SLURRY OF TITANIUM DIOXIDE

Yves Gladu, Quebec, Canada, assignor to NL CHEM Canada Inc., Montreal, Canada

Continuation-in-part of Ser. No. 61,515, Jul. 27, 1979, abandoned. This application May 19, 1980, Ser. No. 151,120

Int. Cl.³ C09C *1/36*

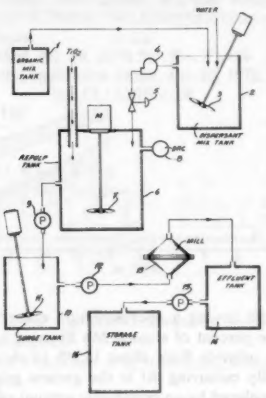
U.S. Cl. 106—300 **12 Claims**

1. A process for preparing a dispersed slurry of dispersant coated rutile titanium dioxide which comprises:

a. preparing a dispersant coated titanium dioxide slurry having a solids content of at least about 60% by weight by mixing rutile titanium dioxide; at least one dispersant additive, and water;

b. passing the dispersant coated titanium dioxide slurry directly through a high shear mill having an impeller

peripheral speed sufficient to de-agglomerate the titanium dioxide but prevent stripping the coating from the titanium dioxide; and



c. recovering a substantially agglomerate-free rutile titanium dioxide slurry having a solids content of at least 60% by weight.

4,288,255

RINSING METHOD AND APPARATUS FOR CAR-WASHING INSTALLATION

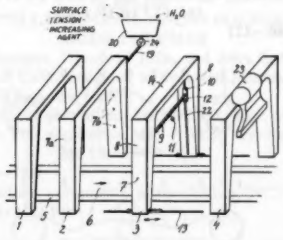
Horst Burger, Gartenstr. 6d, 8901 Neusäss, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 63,170, Aug. 2, 1979, abandoned. This application Nov. 19, 1979, Ser. No. 95,423

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1978, 2834582

Int. Cl.³ B08B *7/00*

U.S. Cl. 134—6 **13 Claims**



1. In a method of cleaning a car wherein the car is treated with soapy water, the car is then prerinsed with water to remove most of the soapy water and then rinsed with clean water to wash off the remaining soapy water, and the clean water is dried and driven off the car by an air stream, the improvement comprising the steps of:

mixing the prerinse water prior to use with a surface-tension-increasing agent to render the surface of said car slightly hydrophobic;

pouring said rinse water from an overhead dispenser onto said car under substantially atmospheric pressure as a substantially continuous film, whereby said film runs off said car substantially without leaving drops behind said dispenser having a downwardly extending curtain formed from filaments, said rinse water being poured by flowing the rinse water down said curtain while maintaining the lower edge of said curtain in contact with the car being washed.

4,288,256

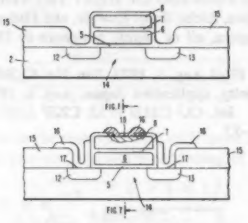
METHOD OF MAKING FET CONTAINING STACKED GATES

Tak H. Ning, Yorktown Heights; Carlton M. Osburn, Croton-on-Hudson, and Hwa N. Yu, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1977, Ser. No. 864,074

Int. Cl.³ B01J *17/00*; H01L *29/27*

U.S. Cl. 148—1.5 **10 Claims**



1. In a method for fabricating an integrated circuit containing an array of FETs and the associated, addressing, decoding and sensing circuits wherein individual FETs of the array include a floating gate and a control gate in a stacked relationship with each other and having electrical insulator between the floating and control gates which comprises:

A. delineating predetermined insulating regions above or recessed into the substrate to provide isolating field regions between FETs of the array;

B. then delineating a first layer of gate-forming material employing the same lithographic mask to provide a floating gate and a control gate which are self-aligned with each other in all lateral directions, and to provide etched regions which are to be subsequently doped for forming source and drain regions self-aligned in the length dimensions with respect to both of said floating and control gates;

C. then thermally diffusing or ion-implanting active impurities into predetermined regions of the semiconductive substrate beneath the etched regions to provide source and drain regions which are self-aligned with respect to said floating and control gates;

D. then providing insulating layer;

E. then delineating contact holes to source and drain regions; and

F. then delineating a metallic-type high-conductivity electrical interconnection pattern that makes electrical connection to the control gates in the array of FETs and to FET sources and drains.

4,288,257

BRASS MATERIAL AND A PROCESS FOR THE PREPARATION THEREOF

Peter Ruchel, Lauf, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Fed. Rep. of Germany

Division of Ser. No. 941,131, Sep. 11, 1978, Pat. No. 4,226,621. This application Mar. 6, 1980, Ser. No. 127,578

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2742008

Int. Cl.³ C22F *1/08*

U.S. Cl. 148—11.5 C **9 Claims**

1. In a process for the preparation of a brass material from a semi-finished material constituted of a copper-zinc alloy of about 61 to 65% by weight of copper with the remainder being zinc, said semi-finished material is cold worked and subse-

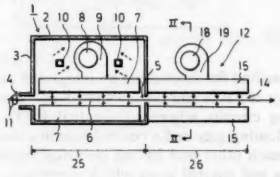
quently subjected to a temperature- and time-measured heat treatment utilized for malleable alloys; the improvement comprising initial formation of the α solid solution only by annealing said alloy at temperatures of 450° to 700° C. and for an annealing period of about 20 hours at 450° C. and for about 15 minutes at 700° C. to totally dissolve all of the β phase; thereafter cold working said alloy to a degree of deformation of at least 50%; and subsequently subjecting said alloy to a heat treatment leading to a β_1 phase precipitation and recrystallization at temperatures of between 200° and 350° C., and an annealing period of between 1 minute and 500 hours.

4,288,258

METHOD FOR COOLING A METAL STRIP DURING THE PROCESS OF HEAT TREATMENT

Selichiro Sekiwa, Aichi; Kenji Kawate, and Hidenobu Jinnouchi, both of Nagoya, all of Japan, assignors to Daidotokushuko, Japan

Filed Aug. 3, 1979, Ser. No. 63,509
Claims priority, application Japan, Aug. 6, 1978, 53-95625
Int. Cl.³ C21D *9/52*; C22F *1/00*
U.S. Cl. 148—13 **5 Claims**



1. In a method, of heat treatment of a metal strip, which includes the steps of:

(a) passing the metal strip lengthwise through a heating zone,

(b) during passage of the metal strip through the heating zone, blowing hot gas onto the strip such that the strip is heated and is also maintained in floating condition by said gas,

(c) upon emergence of said heated strip from said heated zone, immediately passing said heated strip lengthwise through a cooling zone,

(d) during passage of the metal strip through the cooling zone, blowing cool gas onto the strip such that the strip is cooled and is also maintained in floating condition by said gas, the cooling of the metal strip being carried out with a cooling gradient which is sufficiently steep to cause in the strip, if cooled substantially equally over its width, a thermal stress greater than the anti-buckling stress of the strip,

the improvement which comprises cooling the lateral longitudinal portions of the strip more rapidly than a central longitudinal portion thereof, at a rate ensuring that the thermal stress produced in the metal strip is less than the anti-buckling stress thereof.

4,288,259

TANTALUM MODIFIED GAMMA PRIME-ALPHA EUTECTIC ALLOY

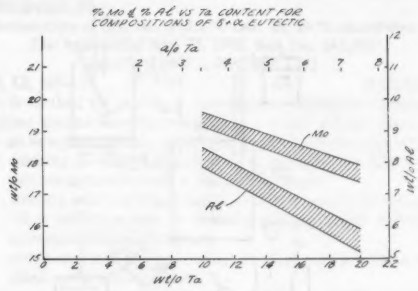
David D. Pearson, West Hartford, and Franklin D. Lemkey, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 4, 1978, Ser. No. 966,416
Int. Cl.³ C22C *19/03*
U.S. Cl. 148—32 **7 Claims**

1. A directionally solidified eutectic article having a composition which satisfies the following relationship:

$12.5\pm0.5\%$ Mo, X% Ta, $[22\pm0.5-X\%]$Al balance essentially Ni,

where all percentages are atomic percentages, and X varies from 3.4 to 7.5,


% Mo & % Al VS Ta CONTENT FOR COMPOSITIONS OF 8+0L EUTECTIC
a/o Ta
2 3 4 5 6 7 8
21 20 19 18 17 16 15
12 11 10 9 8 7 6 5
Mo
Al
a/o Mo
a/o Al
0 2 4 6 8 10 12 14 16 18 20 22
Wt/o Ta

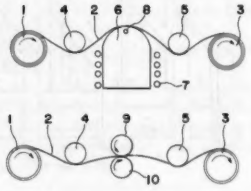
said article having a microstructure comprising about 18 volume percent of aligned Mo fibers in a gamma prime matrix wherein from about 15.5% to about 34% of the normally occurring Al in the gamma prime matrix has been replaced by an equiatomic amount of Ta.

4,288,260

METHOD OF HEAT TREATMENTS OF AMORPHOUS ALLOY RIBBONS

Harufumi Senno, Yamatokoriyama; Hiroshi Sakakima, Hirakata; Yukihiro Yanagiuchi, Katano; Tsuneo Inoue, Moriguchi; Masatsugu Yamaguchi, and Eiichi Hirota, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Continuation of Ser. No. 968,969, Dec. 13, 1978, abandoned.
This application Mar. 26, 1980, Ser. No. 134,132
Claims priority, application Japan, Dec. 16, 1977, 52/151871
Int. Cl.³ H01F *1/00*
U.S. Cl. 148—121 **7 Claims**

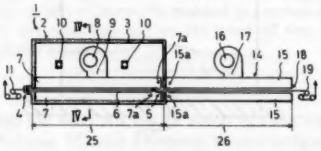


1. A method of heat treating an amorphous alloy ribbon manufactured by a splat cooling method, which comprises continuously transferring said amorphous alloy ribbon at a rate between 1 cm/sec and 50 cm/sec between two stations; contacting the ribbon with at least one heating body intermediate the two stations so that at least one surface of the ribbon directly contacts the heating body during the transfer step, said heating body being maintained at a temperature range (T°C.) which includes the crystallization point temperature T_{cry}°C. of said amorphous alloy ribbon such that the alloy is maintained in an amorphous state, such heat treatment being conducted for a time sufficient to enhance the magnetic properties of the alloy while maintaining the alloy in an amorphous state, wherein said temperature (T°C.) can be defined by the following relationship of $(T_{cry}-200°\ C.)\leqq T\leqq(T_{cry}+50°\ C.)$.

4,288,261
METHOD FOR THE HEAT TREATMENT OF ALUMINUM STRIP

Hiromu Yoshimoto, 1-18 Aza Tabuchi, Yawata, Chita-shi; Michitoshi Okumura, 139 3-chome, Jojo-cho, Kasugai-shi, and Kenji Kawate, 4-2 Naruko-cho, Midori-ku, Nagoya-shi, all of Aichi-ken, Japan

Filed Jul. 13, 1979, Ser. No. 57,474
Claims priority, application Japan, Jul. 15, 1978, 53-86559
Int. Cl.³ C22F *1/04*
U.S. Cl. 148—131 **4 Claims**



1. A method, for the heat treatment of aluminium strip, comprising the steps of:

(i) passing an aluminium strip in floating mode through a heating zone;

(ii) passing the strip, from the heating zone, through a cooling zone in a floating mode so as to be cooled thereby;

(iii) in a portion of the length of the moving strip passing from within the heating zone to within the cooling zone, imparting to the strip a wave-like form extending longitudinally of the strip and having a radius of curvature smaller than the value of the expression

$$\sqrt{\frac{x \cdot 0.339}{y^3}}$$

wherein x is the sum of the lengths of the heating zone and of the cooling zone, and y is the width of the aluminium strip.

4,288,262
GUN PROPELLANTS CONTAINING POLYGLYCIDYL AZIDE POLYMER

Joseph E. Flanagan, Woodland Hills, and John C. Gray, Ventura, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 891,581, Mar. 30, 1978, abandoned. This application May 7, 1979, Ser. No. 39,629
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.6 **9 Claims**

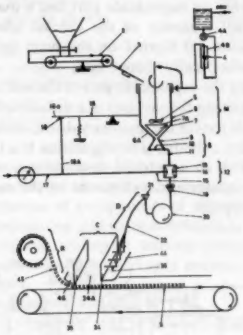
1. A propellant comprising nitrocellulose (NC) and polyglycidyl azide (GAP).

4,288,263
PROCESS FOR MAKING PLASTER BOARD

Adrien Delcoigne, Chantilly, and Jacques Lanneau, Breuil-le-Vert, both of France, assignors to Saint Gobain Industries, Neuilly, France

Filed Jan. 15, 1979, Ser. No. 3,414
Claims priority, application France, Feb. 8, 1978, 78 03473; Feb. 8, 1978, 78 03474; Feb. 8, 1978, 78 03475
Int. Cl.³ B32B *13/04, 13/14*
U.S. Cl. 156—42 **27 Claims**

1. A process for making a board from a fluid evolutive product including pouring said product into a reservoir located above a conveyor moving at a uniform speed, passing said product through a slit transverse to the conveyor so that the board is formed between the conveyor and the downstream wall of the reservoir, characterized by continuously introducing streams of fresh fluid evolutive product substantially horizontally into the reservoir through spaced nozzles discharging

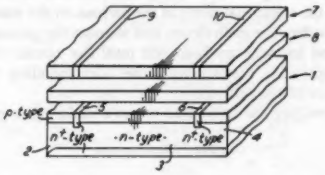


into the product in the reservior with such force as to eliminate dead spots and prevent premature hardening of said product.

4,288,264
DETECTOR CONSTRUCTION

Promod Haque, Evanston, Ill., assignor to EMI Limited, Hayes, England

Filed Nov. 21, 1979, Ser. No. 96,436
Int. Cl.³ H01L *31/18*
U.S. Cl. 156—67 **7 Claims**



1. A method of constructing a detector arrangement for producing electrical output signals in response to penetrating radiation comprising the steps of providing at least one semiconductive photodiode, forming a layer of optical cement on said at least one photodiode, providing a layer of plastics material, which readily peels from said optical cement, on said layer of optical cement, and depositing a layer of phosphor material on said plastics material.

4,288,265
PROCESS AND APPARATUS FOR MANUFACTURING RADIAL TIRES

Antonio Pacciarini, and Giorgio Bertoldo, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Sep. 18, 1979, Ser. No. 76,743
Claims priority, application Italy, Oct. 25, 1978, 29063 A/78
Int. Cl.³ B29H *17/20*
U.S. Cl. 156—126 **25 Claims**

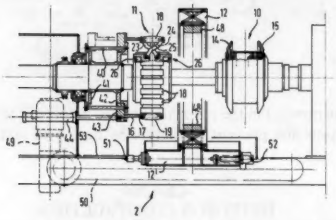
1. In a process for manufacturing radial tires for a motor vehicle having a radial carcass, a reinforcing structure with at least two layers of metallic cords forming a belt, the cords of adjacent layers being criss-crossed with respect to each other, and symmetrically oriented with respect to the longitudinal direction of the tire, and a tread, the said process comprising the steps of:

(a) building-up a carcass in a cylindrical configuration, on an expandable main tire building-drum;

(b) shaping the said carcass in its non-vulcanized state, into a toroidal configuration,

(c) winding two layers of metallic cords on an auxialiary drum having an expandable part and a diameter equal to the external diameter of the carcass after the toroidal configuration (b) thereof on the main building-drum to form a cylindrically shaped belt;

(d) expanding the expandable part of the said auxiliary drum, and maintaining the said belt in a slidable condition on said expandable part of the auxilliary drum, converting the belt from its first cylindrical configuration to a toroidal configuration with an equatorial development which is larger than the equatorial development of the carcass after the shaping step (b);



(e) winding an elastomeric band from which a tread band is formed on the toroidal shaped belt formed in (d);

(f) contracting the auxiliary drum;

(g) removing from the contracted auxiliary drum, the annular layered-band comprising the belt and the tread band,

(h) transferring and centering said annular layered-band with the equatorial plane of the carcass on the main drum;

(i) expanding the main drum, and shaping the carcass into a second toroidal configuration until the carcass crown is brought into contact with the corresponding toroidal surface of the belt; and

(j) vulcanizing the so-formed tire in a mold under pressure.

4,288,266

METHOD FOR HEATED TOOL BUTT WELDING OF TUBE AND PIPE OF THERMOPLASTIC MATERIALS

Klaus-Dieter Konrad, Oberhausen; Rudolf Kellersohn, Hamminkeln; Hans Steck, and Josef Schaub, both of Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 55,879

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830722

Int. Cl.³ B65H *69/00*

U.S. Cl. 156—158 **5 Claims**

1. A process of forming a weld between abutting ends of thermoplastic pipes to be joined which comprises:

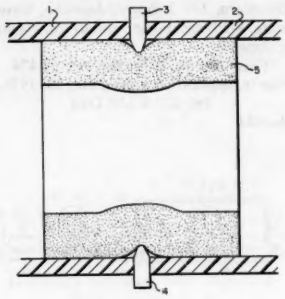
(a) disposing at the point of abutment of said pipes and within said pipes and inwardly deformable elastic insert;

(b) disposing between the ends of said thermoplastic pipe a heated tool such that the ends of said thermopastic pipe abut said heated tool;

(c) heated tool projecting into said inwardly deformable elastic insert to inwardly deform and shape the same and to dispose a portion of said elastic insert away from the point of the weld to thereby reduce the pressure on the inside of said pipe at the point of the weld;

(d) heating said ends by contact with said heated tool to a temperature sufficient to weld their respective ends to one another;

(e) withdrawing said heated tool and fitting said respective ends to one another, whereby said elastic insert bears against and flattens a bead which forms at said weld; and



(f) cooling the pipes while said elastic insert bears against the walls of said thermoplastic pipe at the weld.

4,288,267

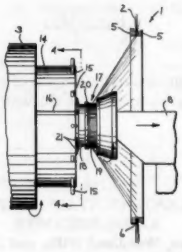
PRELIMINARY AND END WINDING METHOD AND APPARATUS

J. Lowrie McLarty, Mequon, Wis., assignor to McClean Anderson, Inc., Milwaukee, Wis.

Filed Jan. 21, 1980, Ser. No. 113,732

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—175 **15 Claims**



1. A method of forming a fiber reinforced resin article, comprising the steps of forming a coaxial extension on the end of a mandrel, said extension having a smaller outer diameter than the mandrel, positioning the extension longitudinally adjacent a wind-off ring, winding a fibrous strand impregnated with a resin binder on the wind-off ring in a plurality of generally circumferentially turns, transferring the winding of the strand from the wind-off ring to the extension and winding the strand on said extension in a plurality of circumferential turns, transferring the winding of the strand from the extension to the outer surface of the mandrel, winding the strand on the outer surface of the mandrel in a generally helical pattern in a number of superimposed layer to form a wound tubular article, transferring the winding of the fibrous strand from the outer surface of the mandrel to the extension and winding the strand on said extension in a plurality of turns, transferring the winding from the extension to the wind-off ring and winding the strand in a plurality of turns on said wind-off ring, and severing the strand at a location axially outward of and adjacent the mandrel to separate the strands wound on the extension and on the wind-off ring from the wound tubular article.

5. A filament winding machine, comprising a mandrel member, a guide member disposed adjacent the mandrel member and having means for guiding a resin impregnated fibrous strand onto the mandrel member, means to rotate one of said members about its axis, means to advance one of said members

longitudinally and thereby wind the strand onto the mandrel in a helical pattern to form a wound tubular article, an extension connected to an end of the mandrel member in co-axial relation and having a smaller diameter than the mandrel member, and a wind-off ring disposed longitudinally adjacent the extension, said strand being initially wound on said wind-off ring to lock the strand to the ring and the strand then being transferred to said extension and subsequently transferred to the outer surface of the mandrel member, the diameter of the extension being correlated with the diameter of the mandrel and the angle of winding, such that no slippage of the strand occurs as it passes from the extension onto the mandrel, said strand being severed at a location axially adjacent the mandrel to separate the strand wound on the extension and on the wind-off ring from the wound tubular article.

4,288,268

METHOD OF PRODUCING A PROTECTIVE HELMET

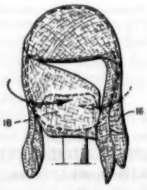
Helmut Hartung, Mirador d'Encamp, France, assignor to Düsseldorfer Lackgrosshandlung Otto Hartung GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 19, 1979, Ser. No. 105,076

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2855967

Int. Cl.³ A42B *3/02*

U.S. Cl. 156—245 **5 Claims**



1. In a method free from heat and fluid pressures of producing a protective helmet of substantially uniform thickness with the aid of a positive-type mold having a surface region of predetermined dimensions, the steps comprising:

applying a first layer of hardenable synthetic resin and shortly thereafter a first single-piece fibrous tissue having an continuous surface area of prearranged dimensions corresponding at least to said surface region of predetermined dimensions on said surface region of said positive-type mold, so as to leave laterally overhanging tissue ends,

thereafter pulling said laterally overhanging ends so as to tension said fibrous tissue, until said surface region is uniformly covered up to at least a predefined longitudinal region, said tensioning step being free from exerting any significant force on said mold, and

subsequently repeating the layer-applying and tensioning steps a prearranged number of times, so as to obtain successive layers forming said protective helmet.

4,288,269

REMOVAL OF PROTECTIVE PAPER TAPE AND MASKANTS

Walter Batiuk, Seattle, Wash., assignor to Boeing Aerospace Co., Seattle, Wash.

Filed Dec. 21, 1979, Ser. No. 106,232

Int. Cl.³ B32B *13/00*

U.S. Cl. 156—344 **5 Claims**

1. A method for the removal of adhesively-bound protective paper from a substrate, comprising:

applying a single-phase solvent solution that penetrates the paper and adhesive consisting essentially of by volume:

-continued

methyl ethyl ketone, acetone, butyl acetone	50–70%
a lower aliphatic alcohol	10–20%
toluene	5–10%
a non-ionic wetting agent from the group of propylene glycol, NH_4OH or a sulfate-free detergent	1–10%
deionized water	5–10%

immediately covering the treated area of with a vaportight barrier sheet sealed about its periphery to prevent selective evaporation of components of said solvent solution thereby maintaining said solvent solution in a single phase until the organic coating or maskant loosens and blisters from the solvent action and vapor pressure of the single-phase solution,

removing said barrier, and

mechanically removing said adhesively-bound protective paper from the substrate.

4,288,270

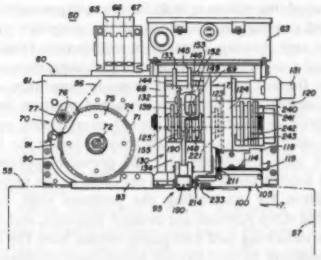
HEAT-SEALING STRAPPING MACHINE

Alan T. Mossell; James R. Simmons, both of Homewood, and Charles G. Middleton, Schaumburg, all of Ill., assignors to Interlake, Inc., Oak Brook, Ill.

Filed Jun. 4, 1979, Ser. No. 45,224

Int. Cl.³ B30B *15/34*; B65B *13/32*

U.S. Cl. 156—359 **15 Claims**



5. Heat sealing apparatus for use in a strapping machine for applying plastic strap around an object with the leading end of the strap overlapping and spaced from the supply portion thereof in a strap-sealing region, said heat sealing apparatus comprising a heating element movable between a strap-heating position disposed in said sealing region between the overlapping portions of the strap and a retracted position displaced from between the overlapping portions of the strap, pressure-applying means including movable pressing means and cam means engageable with said pressing means for effecting movement thereof, said cam means including a first resiliently yieldable portion engageable with said pressing means when said heating element is in the strap-heating position thereof for resiliently moving said pressing means to a first pressing condition pressing the overlapping strap portions against said heating element with a predetermined limited force for melting the facing surfaces of the overlapping strap portions, and means for moving said heating element to the retracted position thereof while said pressing means is in the first pressing condition thereof so that the melted overlapping portions of the strap are pressed together as said heating element is withdrawn from therebetween, said cam means having a second portion engageable with said pressing means after said heating element has been moved to the retracted position thereof for effecting movement of said pressing means to a second pressing condition to increase the force with which the melted overlapping

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a ketone from the group of

portions of the strap are pressed together thereby to insure the formation of a solid joint therebetween, said pressing means including control means for limiting the pressure with which the overlapping strap portions are pressed together in the second pressing condition.

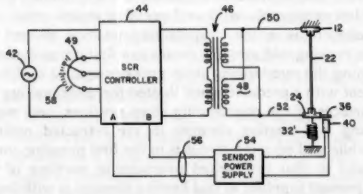
12. Heat sealing apparatus for use in a strapping machine for applying plastic strap around an object with the leading end of the strap overlapping and spaced from the supply portion thereof in a strap-sealing region, said heat sealing apparatus comprising a heating element movable between a strap-heating position disposed in said sealing region between the overlapping portions of the strap and a retracted position displaced from between the overlapping portions of the strap, energizing means connected to said heating element for heating thereof and switchable between first and second energizing conditions, said energizing means in the first energizing condition thereof heating said heating element to a temperature in a first predetermined temperature range sufficient for melting the facing surfaces of the overlapping portions of the strap, said energizing means in the second energizing condition thereof heating said heating element to a temperature in a second predetermined temperature range above said first predetermined range and sufficient for burning from said heating element residues picked up from the melted portions of the strap, pressure-applying means operable when said heating element is in the strap-heating position thereof to a first pressing condition pressing the overlapping strap portions against said heating element for melting the facing surfaces of the overlapping strap portions, said pressure-applying means including first resilient means operable in the first pressing condition for controlling the pressure with which the overlapping strap portions are pressed against said heating element, means for moving said heating element to the retracted position thereof while said pressure-applying means is in its first pressing condition so that the melted overlapping portions of the strap are pressed together as said heating element is withdrawn from therebetween, said pressure-applying means including means effecting operation thereof to a second pressing condition after said heating element is moved to its retracted position for increasing the force with which the melted overlapping portions of the strap are pressed together thereby to insure the formation of a solid joint therebetween, said pressure-applying means including second resilient means operable in the second pressing condition for controlling the pressure with which the overlapping strap portions are pressed together, and switching means for switching said energizing means from the first energizing condition to the second energizing condition thereof when said heating element is in the retracted position thereof.

4,288,271

TEMPERATURE CONTROL APPARATUS

Glenn M. Campbell, Jr., Hopkins, Minn., and Raymond K. Newkirk, 110 Loring Dr., Mound, Minn. 55364, assignors to Raymond K. Newkirk, Mound, Minn.

Filed May 27, 1980, Ser. No. 153,082
Int. Cl.³ B05G *15/00*
U.S. Cl. 156—359 **1 Claim**



1. In a machine for bonding two three-dimensional thermoplastic bodies together along a juncture zone, a thermal bonding blade assembly which is adapted to traverse said juncture zone comprising in combination:

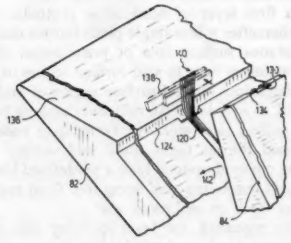
(a) a first conductive holding block insulating lead mounted on an upper movable carriage arm;
(b) a second conductive holding block;
(c) tensioning means insulatively coupled between said second conductive block and a lower carriage arm;
(d) an elongated thermal bonding blade having a predetermined coefficient of linear expansion conductively coupled between said first and second holding block;
(e) means for applying an electrical voltage between said first and second conductive block;
(f) a controllable regulator for controlling said electrical voltage;
(g) means coupled between said second conductive holding block and said lower movable carriage arm for sensing the relative displacement between said second conductive holding block and said lower movable carriage arm and producing an electrical control signal proportional thereto; and
(h) means coupling said control signal to said controllable regulator whereby the heating current flowing through said thermal bonding blade is regulated as a function of the thermal expansion of said blade.

4,288,272

LABEL APPLICATOR WITH SENSOR

George B. Pfeffer, Minnetonka, Minn., assignor to Datafile Limited, Willowdale, Canada

Filed Jun. 4, 1979, Ser. No. 43,821
Int. Cl.³ B65H *5/28*; G01N *21/86*
U.S. Cl. 156—361 **14 Claims**

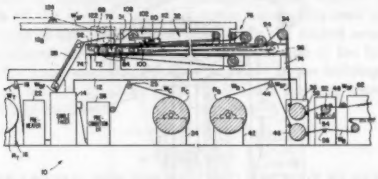


1. In apparatus for separating spaced-apart labels from a carrier, a ramp having a tongue portion about which such carrier travels to separate labels from carrier, a fibre optic bundle having a first end positioned in an opening defined in the ramp surface near the tongue and its second end remote from said tongue, said ramp having a parting line between two ramp components, said parting line being near said tongue portion, one of said components being removable from said ramp, the parting line having a recessed area to define said opening for and confine said first bundle end, a label sensor comprising an emitter unit and receiver unit, one of said units spaced from and directed at said first bundle end and the other unit, positioned in said ramp and directed at the remote bundle end, such carrier with labels travelling over said first bundle end whereby a predetermined detected decrease in emitter beam intensity received by said receiver indicates a label.

4,288,273
METHOD AND APPARATUS FOR MAKING CORRUGATED BOARD

Richard A. Butler, Jr., Greenwich, Conn., and Bucky Crowley, Newton, Mass., assignors to Butler Greenwich Inc., Greenwich, Conn.

Filed May 12, 1980, Ser. No. 148,580
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—361 8 Claims



1. A corrugator comprising

A. a single facer,

B. means for conducting liner web to the single facer,

C. means for conducting corrugating medium web to the single facer, said single facer fluting the corrugating medium web and laminating said web to produce single face web having a fluted face,

D. a double backer,

E. means for conducting the single face web to the double backer, said conducting means including a web accumulator located between the single facer and the double backer, said accumulator comprising

(1) one or more stationary rollers,

(2) one or more dancer rollers, said single face web being looped back and forth between said stationary dancer rollers so that the fluted face of said single face web engages around at least some of said rollers,

(3) means defining a track for the dancer rollers so that the dancer rollers can move toward or away from the stationary rollers,

(4) means for force loading the dancer rollers along said track away from the stationary rollers so that the single face web being conducted from the single facer to the double backer is maintained under low and substantially constant tension across its full width thereby imparting a low and substantially uniform pressure to the flutes in the single face web,

(5) means for controlling the speed of the single facer or the double backer in response to the positions of the dancer rollers with respect to a reference position to allow control over either the amount of material or the amount of time the material spends between the single face and the double back processes, independent of the overall process speed and

F. means for conducting liner webs to the double backer for laminating with the single face web conducted thereto so as to produce corrugated board having minimum warpage and substantially uniform crush strength along its length and breadth.

4,288,274
METHOD OF AND APPARATUS FOR APPLYING VENEER FOILS TO A BOARD

Karl-Heinz Holz, Krefeld, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 105,880
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855870
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—364 3 Claims

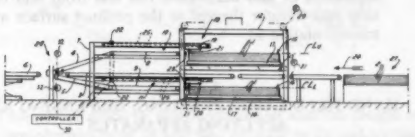
1. In an apparatus for making a laminate, said apparatus comprising:

a rack having upper and lower vertically displaceable platforms adapted to support respective stacks of upper and lower foils;

means connected to said platforms for vertically displacing same to position the uppermost foils of the respective stacks at respective upper and lower levels;

transport means including a central conveyor having an upstream stretch extending horizontally between said upper and lower platforms to an assembly location spaced downstream in a transport direction from said platforms and a downstream stretch extending from said location away from said platforms for displacing a board in said transport direction between said platforms to said assembly location;

respective upper and lower suction-belt conveyors having upstream ends substantially at said levels and downstream ends at said assembly location, said upper and lower conveyors having respective horizontal upstream stretches substantially at the respective levels and respective downwardly and upwardly inclined downstream stretches extending from the respective upstream stretches to said assembly location;



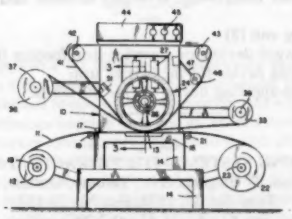
pickup means including upper and lower horizontally displaceable carriages provided generally at the respective levels with suction lifters and displaceable between upstream positions above the respective stacks and downstream positions above said upstream stretches of the respective upper and lower conveyors for picking the uppermost foils off said stacks at said levels and depositing them on the upstream stretches of said upper and lower conveyors, said carriages being displaceable horizontally in said direction the full length of the respective upstream stretches; and

control means connected to said conveyors and to said carriages for sandwiching said board between one of said lower foils and one of said upper foils at said assembly location and then transporting the sandwich away from said location in said direction.

4,288,275
ROLL LEAF COATING APPARATUS

Jesse B. Davis, 196 So. Kilburn Rd., Garden City, N.Y. 11530

Filed May 14, 1979, Ser. No. 38,630
Int. Cl.³ B05C *11/02;* B29C *27/00*
U.S. Cl. 156—367 14 Claims



1. Apparatus for applying a decorative roll leaf to the surface of a product 11, from a foil comprising a carrier strip having said decorative roll leaf detachably adhered with a

thermally meltable adhesive to one side thereof, which apparatus includes;

a platform **16** adapted to support said product **11**,

a pressure member **24** having an outer surface positioned adjacent to said platform **16** and being operable to exert a force in the direction of the latter, and to define a transfer station **13** therebetween,

product handling means positioned adjacent to said transfer station whereby to guide said product into said station,

foil transfer means **37, 39** positioned to introduce said foil into said transfer station **13** and into registry with said product **11** surface,

a thermal belt **41** defining a closed loop,

a heat source **44**,

belt guide means engaging said thermal belt **41** to progress the latter along said closed loop, and to guide a belt section sequentially into heat exchange relationship with said heat source **44**, and thence into heat exchange contact with at least a part of the outer surface of said pressure member, whereby to melt said adhesive and to cause separation of said decorative roll leaf from said carrier strip and transfer thereof to the product surface at said transfer station **13**.

4,288,276

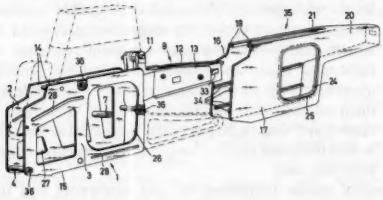
HAND-HELD LABEL PRINTING, DISPENSING AND APPLYING APPARATUS

Kurt Schrotz, and Werner Becker, both of Hirschhorn, Fed. Rep. of Germany, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Jun. 20, 1979, Ser. No. 50,427

Int. Cl.³ B65C *11/02*

U.S. Cl. 156—384 **14 Claims**



1. A hand-held labelling apparatus for printing, dispensing and applying self-adhering labels, comprising:

a housing **(1)** provided with a handle **(8)** and having two side walls **(2,3)** consisting of sheet metal and held in spaced relation each side wall **(2,3)** comprises two parallel and free edges **(14,15)** which are opposite one another

casing or sheathing walls **(16,17)** consisting of synthetic plastics and capable of being pushed over the outsides of each side wall **(2,3)**, the said casing walls comprising flanges **(18,19)** which engage over the free edges **(14,15)** of the side walls **(2,3)**

and further comprising, arranged between said side walls **(2,3)**

a printing unit **(5)**

a withdrawal device for a carrier strip feeding the labels

a deflecting device for the carrier strip

a pressure-applying device **(6)** for the labels.

4,288,277

MOLDING SYSTEM WITH RETRACTING MOLD

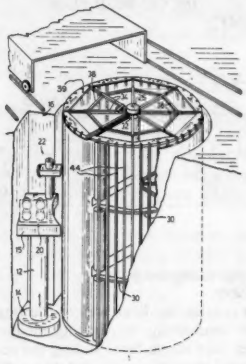
Lembit Siilats, 37 Bingham Ave., Toronto, Ontario, Canada

Filed Jul. 17, 1979, Ser. No. 58,137

Int. Cl.³ B65H *81/00;* **B29C** *1/00*

U.S. Cl. 156—425 **7 Claims**

1. A radially retractable and expansible cylindrical mold of modular form having an axially extending support means; a plurality of spider means mounted in mutual axially spaced relation on the support means, the spider means including radially extending arms having segment portions arcuately arranged thereabout in secured relation therewith; axially extending rib means interconnecting said segment portions to provide a support form of substantially cylindrical shape; said arms including individual fluid pressure actuator means to



extend the arms radially outwardly upon pressurization of said actuator means, to increase the effective diameter of said cylindrical shape, flexible wrapping diaphragm means positioned in wrapped covering relation about said rib means, and means to tension said wrapping means to receive in use molding material in support relation therewith.

4,288,278

APPARATUS FOR CONTINUOUSLY PRODUCING PLEATED SEMIPERMEABLE MEMBRANE ELEMENTS

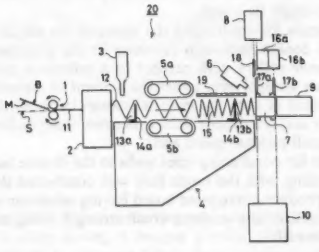
Hisataro Akao, Sakai, Japan, assignor to Daicel Chemical Industries Ltd., Osaka, Japan

Filed Dec. 4, 1979, Ser. No. 100,237

Claims priority, application Japan, Dec. 8, 1978, 53-152326; May 12, 1979, 54-58321

Int. Cl.³ B31F *1/34*

U.S. Cl. 156—474 **12 Claims**



1. An apparatus for continuously producing pleated semipermeable membrane elements comprising means for continuously feeding a strip of assembly composed of a synthetic resin semipermeable membrane and a spacer in the form of a thin sheet and superposed on at least one side of the semipermeable membrane; folding means having a pair of upper and lower folding blades for loosely folding the assembly fed by the feeding means; adhesive applying means disposed within, or to the front or rear of the folding means for applying an adhesive to the opposite selvage portions of the assembly on one side thereof; holding cases each having an openable lid at each of its inlet and outlet; transfer means for placing the folded portion of the assembly into one of the holding cases while progres-

sively folding the assembly more compactly, said transfer means comprising a plurality of pilot plates insertable between pleats of the folded assembly, at least two pairs of guide chains operable by frictional power transmission for moving the pilot plates as supported vertically thereon, means for attaching the pilot plates to the guide chains at a specified spacing and removing the pilot plates from the guide chains, and a pair of upper and lower belt conveyors positionable above and under the folded assembly and approximately equal to the folded assembly in width; counter means disposed in the vicinity of the inlet of the holding case for counting the number of the pleats of the folded assembly; cutter means disposed on the inlet side of the holding case for cutting the folded assembly; compressing means disposed on the outlet side of the holding case for compressing the folded assembly in the holding case; and means for selecting said one of the holding cases and supplying the same.

4,288,279

APPARATUS FOR PRODUCING BAGS OF PLASTICS MATERIAL

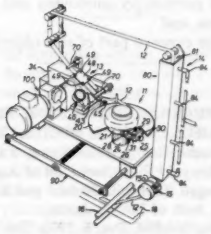
Peter D. Blore, Beeston, and David S. Wheatley, Ilkeston, both of England, assignors to Metal Closures Venue Packaging Limited, Ilkeston, England

Filed Jul. 12, 1979, Ser. No. 56,891

Claims priority, application United Kingdom, Jan. 12, 1979, 1255/79

Int. Cl.³ B32B *31/04*

U.S. Cl. 156—498 **25 Claims**



1. Apparatus for producing bags of plastics material having an opening closable by a flap and a band of adhesive for securing the flap after closing of the opening, the band of adhesive being covered by a releasable strip of plastics material, the apparatus including a reel holder for rotatably supporting a reel of the releasable strip, guide means for feeding the strip in succession passed on adhesive applicator for applying a band of adhesive to one side of the strip, further guide means for guiding a continuous length of folded plastics material for forming the bags to heat severing means which operate to sever separate bags from said continuous length and also fuse together the edges of each separated bags, and pressure means arranged to apply the strip to said continuous length so that the strip is secured by the band of adhesive to said continuous length before it is fed to the severing means, a reel holder including a table rotatable about a vertical axis and arranged to support the reel horizontally, brake means being provided for restraining rotation of the table so as to tension the strip as it is pulled off the reel.

4,288,280

TAPE APPLYING MACHINE

Robert W. Morin, Salem, Mass., assignor to Boston Machine Works Company, Lynn, Mass.

Filed Oct. 19, 1979, Ser. No. 86,355

Int. Cl.³ B26D *7/08*; B65C *9/18*

U.S. Cl. 156—510 **7 Claims**

1. A tape applying machine comprising:

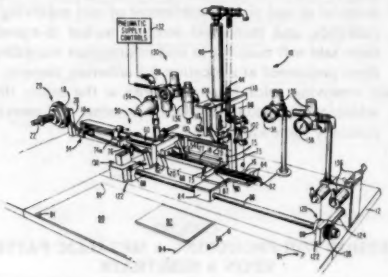
(a) means for supporting a supply of tape;

(b) a member pivotable between a first position and a second position and mounted in operative association with said supply of tape;

(c) means for feeding a set length of said tape onto said member while it is in its said first position;

(d) a cutter mounted adjacent said member to cut said length of said tape while said member is in its said first position;

(e) work support for locating a piece of work in operative association with said member; and



(f) means for pivoting said member and said cut length of tape thereon from its said first position to its said second position for applying said cut length of tape onto said workpiece;

(g) said means for feeding a set length of said tape including a cylinder whose piston is provided with a feed detent at its forward end and a grabber at its rear end, said feed detent and said grabber simultaneously operable, first between a tape-engaging and secondly a non-engaging position.

4,288,281

APPLIANCE FOR ADHERING A SENSING MARKER ON A MEDIUM FOR RECORDING INFORMATION

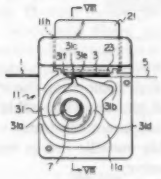
Kaoru Kanda, Yokohama, Japan, assignor to Sigma Corporation, Tokyo, Japan

Filed Sep. 12, 1979, Ser. No. 75,243

Claims priority, application Japan, Sep. 28, 1978, 53-118666; Sep. 28, 1978, 53-118667; Oct. 13, 1978, 53-125075; Mar. 2, 1979, 54-23435

Int. Cl.³ B44C *7/02*

U.S. Cl. 156—540 **7 Clai..**



1. An appliance for adhering an adhesively-backed sensing marker on a medium for recording information, comprising:

a case adapted to accommodate a marker roll which includes a continuous backing liner and an adhesively-backed sensing marker having a predetermined length and width and adhered on said backing liner;

a removing rotor having a substantially flat surface providing a station for receiving said backing liner withdrawn from said marker roll and disposed in said case pivotably about an axis between a first position, where one of said sensing markers is positioned at said station, and a second position, whereby said sensing marker is removed from said backing liner as the pivotal movement of said remov-

ing rotor proceeds from said first position to said second position;

a transferring member having a soft material mounted thereon in the form of a substantially flat surface corresponding to said substantially flat surface of said removing rotor station and capable of being pressed toward said sensing marker on said backing liner at said removing rotor positioned in said first position, whereby said sensing marker is transferred from said backing liner to said soft material as said pivotal movement of said removing rotor proceeds, and then, said sensing marker is transferred from said soft material to said information recording medium positioned at a location for adhering thereon;

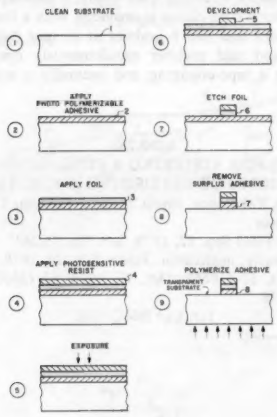
said removing rotor having a cavity at the center thereof, which cavity is adapted to accommodate said marker roll coaxially therewith.

4,288,282

METHOD FOR PRODUCING A METALLIC PATTERN UPON A SUBSTRATE

Lawrence E. Brown; James L. Bauer, and Gerald W. Scheck, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 28, 1979, Ser. No. 79,865
Int. Cl.³ B44C *1/22;* C23F *1/02;* H01L *21/312*
U.S. Cl. 156—630 **2 Claims**



1. A process for producing upon a transparent substrate a pattern in a metallic foil, comprising the steps of:

applying a layer of photopolymerizable adhesive to a first surface of the transparent substrate;

applying an etchable metallic foil to the layer of photopolymerizable adhesive;

applying a layer of photoresist to the etchable metallic foil;

exposing the photoresist to a desired pattern of actinic radiation;

removing the exposed photoresist to uncover the underlying etchable metallic foil;

etching away the uncovered portion of the etchable metallic foil;

etching away the portions of the layer of photopolymerizable adhesive uncovered by the step of etching the etchable metallic foil; and

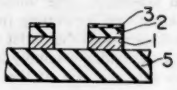
polymerizing the remaining photopolymerizable adhesive by exposing it to actinic radiation passing through the transparent substrate from a second surface opposite the first surface.

4,288,283

METHOD OF FORMING A MICROSCOPIC PATTERN

Hiroshi Umezaki, Hachioji; Hideki Nishida, Hinodemachi; Norikazu Tsumita, Kodaira; Hirozi Yamada, Hachioji; Katsuhiro Kaneko, Sayama, and Nagatugu Koiso, Tama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 8, 1980, Ser. No. 110,445
Claims priority, application Japan, Jan. 10, 1979, 54/714
Int. Cl.³ C23F *1/02*
U.S. Cl. 156—643 **9 Claims**



1. A method of forming a microscopic pattern, comprising the steps of:

(a) depositing a film to effect masking onto an object to-be-etched,

(b) forming a reflection reducing film on said film to effect masking,

(c) depositing a photoresist film onto said reflection reducing film,

(d) forming a photoresist pattern by irradiating a desired portion of said photoresist film with light and thereafter conducing development,

(e) removing the exposed part of said reflection reducing film and the masking film which is disposed underneath said exposed portion, by employing said photoresist pattern as a mask, and

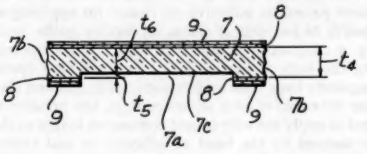
(f) removing the exposed part of said object to-be-etched.

4,288,284

METHOD OF PRODUCING HOUSING ELEMENT FOR QUARTZ CRYSTAL OSCILLATOR

Masatoshi Kobayashi; George Shimakawa; Yukio Hara, all of Nagano, and Hiroyuki Fujii, Suwa, all of Japan, assignors to Matsushima Kogyo Kabushiki Kaisha and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Division of Ser. No. 966,688, Dec. 5, 1978. This application Apr. 17, 1980, Ser. No. 141,025
Claims priority, application Japan, Dec. 5, 1977, 52/145863; Dec. 5, 1977, 52/145864
Int. Cl.³ H01L *21/306;* C03C *15/00, 25/06*
U.S. Cl. 156—651 **6 Claims**



1. A method for producing a housing element for a thin, flat quartz crystal oscillator package, said element being formed from planar material having a finite thickness, and having a recessed concave portion therein, comprising the steps of:

(a) coating the opposed planar surfaces of said planar material with a masking film, said masking film edges defining the peripheral edges of said housing element and being resistant to chemical etching;

(b) chemically etching said planar surfaces whereby the peripheral edge portions of said housing element are etched away;

(c) removing said masking film to expose a defined portion of one of said planar surfaces;

(d) chemically etching said defined portion to produce said recessed concave portion in said housing element,

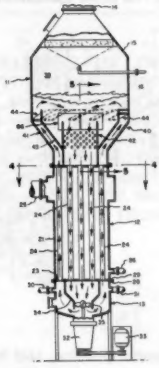
whereby the time allowed for etching said peripheral edges and said recessed concave portions can be independently determined.

4,288,285

APPARATUS FOR FORMING A VORTEX

James E. Houston, Grand Island, N.Y., assignor to Evaporator Technology Corporation, Buffalo, N.Y.

Filed Jul. 28, 1980, Ser. No. 173,141
Int. Cl.³ B01D *9/02*
U.S. Cl. 159—1 C **9 Claims**



1. Apparatus for forming a vortex, comprising:
an outer wall having an upper end and a lower end;
a first wall arranged within and spaced from said outer wall, said first wall having an upper end and a lower end and defining an inner flow passageway therewithin;
a second wall arranged within and spaced from said outer wall, said second wall having a lower end joining said first wall and forming with said first and outer walls an annular outer flow passageway;
a plurality of inclined vanes joining said second and outer walls and arranged to induce an upward flow through said outer flow passageway to swirl; and
fluid supply means operatively arranged to maintain a level of fluid within said apparatus such that said vanes will be submerged and for causing a fluid flow upwardly through said outer passageway and downwardly through said inner passageway;
thereby to create a vortex within said apparatus.

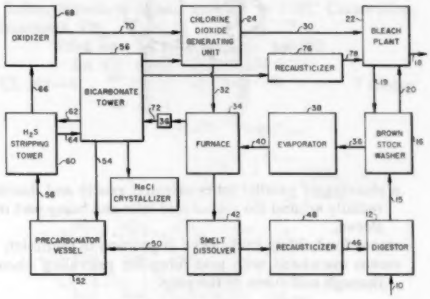
4,288,286

KRAFT MILL RECYCLE PROCESS

Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation of Ser. No. 967,933, Dec. 8, 1978, abandoned, which is a continuation of Ser. No. 753,656, Dec. 22, 1976, abandoned. This application Mar. 3, 1980, Ser. No. 126,594
Int. Cl.³ D21C *11/04*
U.S. Cl. 162—30 R **12 Claims**

1. An integrated process for pulping and bleaching cellulosic material and sulfur recovery comprising the steps of:
(a) digesting a fibrous pulp,
(b) separating the fibrous pulp and waste liquor produced by said digesting step,
(c) evaporating and burning said waste liquor in a furnace to form a smelt and stack gas,
(d) dissolving said smelt to form a green liquor and causticizing a portion of said green liquor for use in (a),
(e) treating a portion of said green liquor with a solution of $NaHCO_3$ containing CO_2 in a closed vessel to produce a precarbonate solution containing NaHS,
(f) stripping said precarbonate solution to produce hydrogen sulfide and a solution of Na_2CO_3,
(g) utilizing the Na_2CO_3 solution from (f) and CO_2 to produce a solution of $NaHCO_3$ and a chloride stream, and utilizing a portion of the $NaHCO_3$ solution as a feed material in (e), and a further portion of the $NaHCO_3$ solution as a feed material in (f),



(h) oxidizing at least a portion of said hydrogen sulfide to produce H_2SO_4,
(i) utilizing at least a portion of said H_2SO_4 as feed stock in a chlorine dioxide generator to react with an alkali metal chlorate and an alkali metal chloride to produce ClO_2 and an alkali metal sulfate, and
(j) utilizing said alkali metal sulfate as a feed into said furnace.

4,288,287

PHOTOGRAPHIC SUPPORT

Masao Miyama, and You Kusama, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jan. 11, 1980, Ser. No. 111,297
Claims priority, application Japan, Jan. 16, 1979, 54-3572; Jan. 20, 1979, 54-5690
Int. Cl.³ D21H *1/34*
U.S. Cl. 162—135 **4 Claims**

1. A photographic support which comprises a paper made from woodpulp fibers and containing a sizing agent and a strength reinforcing agent, and a polyethylene resin coated thereon, the bone dry weight ratio of said strength reinforcing agent to said sizing agent being 1.8–4.0 to 1 and the amount of the sizing agent being 0.3–10.0% by weight of the woodpulp fibers, wherein said polyethylene resin coated on the back side of the paper contains 35–80% by weight of low-density polyethylene, wherein woodpulp fibers constituting the paper stock have fractionation characteristics in accordance with the fractionation method specified in JISP8207 such that 0% is retained by the first wire sieve cloth having a sieve opening of 710 μm and not more than 35% is retained by the second wire sieve cloth having a sieve opening of 350 μm.

4,288,288

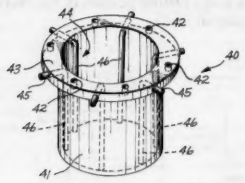
APPARATUS FOR MIXING CHEMICALS INTO PULP AT A REFINER INLET

John A. Fleck, Everett, and Michael D. Meredith, Federal Way, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Jun. 15, 1979, Ser. No. 48,933
Int. Cl.³ D21D *1/30*
U.S. Cl. 162—261 **15 Claims**

1. Apparatus for mixing chemicals with pulp comprising a casing,
a refiner section in said casing,
a pair of opposed refiner plates in said refiner section rotatably movable with respect to each other,
an inlet to said refiner section,

said inlet having an inner wall,
an outlet in said casing,
a sleeve extending along the inner wall of said inlet, said sleeve having a wall with inner and outer surfaces,



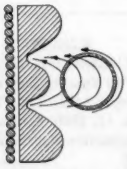
a plurality of parallel tubes oriented axially and distributed radially around the axis of said inlet and being part of said sleeve,
means for holding said sleeve in position in said inlet,
means associated with said tubes for providing chemicals through said tubes to the pulp.

4,288,289

STRONG FOCUSING MEGATRON

Ronald W. Landau, 1015 Ocean Pkwy., Brooklyn, N.Y. 11230

Filed Mar. 30, 1978, Ser. No. 891,602
Int. Cl.³ G21B *1/00*
U.S. Cl. 176—3 **15 Claims**



1. A fushion machine comprising a hollow toroidal chamber, a gas of ionized isotopes of hydrogen in said chamber, means for establishing an inducing magnetic field whose amplitude is controllably variable and which has a component perpendicular to the plane of said hollow toroidal chamber and said component being coaxial with the axis of revolution of said hollow toroidal chamber so that an increasing circular plasma electric current is induced in said hollow toroidal chamber as said inducing magnetic field increases, and generating means for generating a strong focusing magnetic field whose amplitude is controllably variable to be proportional to the plasma current and which is toroidally disposed about said axis of revolution and enters on one side of said hollow toroidal cylinder, passes through said hollow toroidal chamber and exits on the other side of said hollow toroidal cylinder in a direction parallel to said axis of revolution.

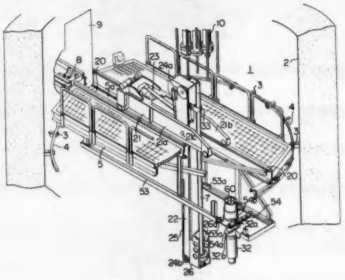
4,288,290

APPARATUS FOR EXCHANGING CONTROL ROD DRIVE MECHANISM IN A NUCLEAR REACTOR

Tooru Saima, Tokyo; Isao Ohya, Yokohama; Takahiko Imada, Akishima; Hideo Sato, Hachioji, and Shinichi Katsuma, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Jan. 15, 1979, Ser. No. 3,523
Claims priority, application Japan, Jan. 19, 1978, 53/4717
Int. Cl.³ G21C *17/00, 19/20*
U.S. Cl. 176—19 R **16 Claims**

1. In apparatus for exchanging a control rod drive mechanism of a nuclear reactor of the type comprising a horizontal platform supported to be rotatable in a working chamber disposed below a reactor pressure vessel and a traveling carriage traveling on a rail assembly laid on said platform, the improvement which comprises a beam attached to said traveling carriage to be swingable between the vertical and horizontal portions and provided with a carrier for vertically moving said control rod drive mechanism, bolt mounting means for loosening and clamping bolts which are used to connect said control rod drive mechanism to a housing in the reactor pressure vessel; holding means secured to said beam for carrying one end of said control rod drive mechanism when said control rod mechanism is separated from said bolt mounting means and holding said control rod drive mechanism when said beam is



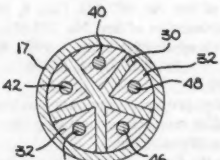
swung to said horizontal position, said holding means being received in a position where said holding means is not interferred with said carrier when said carrier passes near said holding means; means for conveying said bolt mounting means in and out of the passage of movement of said carrier so that said control rod drive mechanism can easily be withdrawn vertically without being interferred with said bolt mounting means; and means for receiving said control rod drive mechanism when said beam has been moved to said horizontal position and for conveying said control rod drive mechanism into an inspection chamber for inspecting said control rod drive mechanism through a passage provided for the peripheral wall of said working chamber.

4,288,291

RADIATION DETECTOR FOR USE IN NUCLEAR REACTORS

Terry C. Cisco, Glendale, and Algert G. Grimaila, Northridge, both of Calif., assignors to Whittaker Corporation, Burbank, Calif.

Filed May 11, 1979, Ser. No. 38,200
Int. Cl.³ G21C *17/00*
U.S. Cl. 176—19 R **8 Claims**



1. A multiple sensor radiation detection device for insertion into a nuclear reactor comprising:
an outer tubular sheath member;
an electrically conducting member having a crosssection comprised of a plurality of radially extending arms joined at their center, said conducting member having a crosssec-

tional diameter substantially equal to the inner diameter of said sheath;

said electrically conducting member being inserted into said sheath member so as to divide the interior volume of said sheath member into a plurality of volumes having a generally wedge-shaped cross-section extending axially long said sheath; and

at least two radiation sensors each of which is located within a respective one of said volumes of wedge-shaped cross-section and spaced from said electrically conducting member by a dielectric whereby said electrically conducting member is a common conducting member for each radiation sensor.

4,288,292

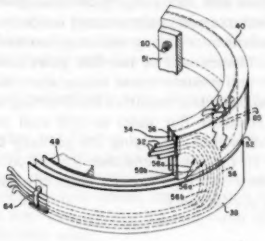
CONNECTING APPARATUS FOR LIMITED ROTARY OF RECTILINEAR MOTION (II)

Roy T. Hardin, Jr., Greensburg, and Carl D. Kurinko, Penn Township, Westmoreland County both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 800,256, May 25, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 28,018

Int. Cl.[2] G21C *13/10*; H02G *11/00*

U.S. Cl. 176—87 **5 Claims**



1. Apparatus for providing connection between a first member and a second member movable within a horizontal plane with respect to said first member, comprising:

a. a first plurality of affixed vertical surfaces laterally spaced, each having a laterally extending upper restraint;

b. a second plurality of affixed vertical surfaces laterally spaced, each having a laterally extending lower restraint;

c. structure for affixing said first surfaces to said first member and said second surfaces to said second member such that said first surfaces are laterally aligned with said second surfaces and are vertically spaced therefrom a preselected distance;

d. a plurality of flexible cables of substantially similar diameter, each said cable being stationary at one portion with respect to said first member and stationary at another portion with respect to said second member and positioned partially between two consecutive first surfaces and partially between two consecutive second surfaces and between their respective restraints so as to form a generally C-shaped loop in a substantially vertical orientation which slidingly moves with respect to said surfaces upon relative motion of said first and second members; and

e. a plurality of flexible devices affixed to said first surfaces for supporting the upper portion of each said looped cable, said flexible device including a flexible body affixed to one of said first vertical surfaces having an upper section and a crimped lower segment, said lower segment spaced from one of said vertical surfaces a distance less than said diameter and said upper section spaced from said last-named surface a distance greater than said diameter, whereby upon relative motion of said members in one direction said loops of said cables contact said crimped segment from below, flex said segment laterally, and pass above said segment, and upon relative motion in the opposite direction said loops flex said segment laterally and pass free from said segment.

4,288,293

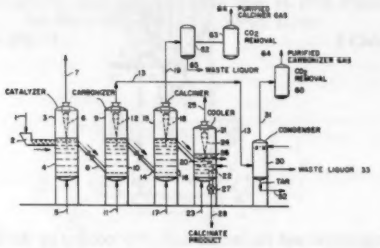
FORM COKE PRODUCTION WITH RECOVERY OF MEDIUM BTU GAS

Erik Saller, Stamford, Conn., assignor to FMC Corporation, Philadelphia, Pa.

Filed Apr. 14, 1980, Ser. No. 140,392

Int. Cl.[3] C10B *49/10*; C10J *3/54*

U.S. Cl. 201—6 **7 Claims**



1. In the production of metallurgical form coke briquettes wherein:

(a) coal particles are heated in the presence of oxygen below tar forming temperatures; wherein (b) the oxidized coal particles from (a) are heated to carbonization temperatures to evolve tar forming vapors and give reactive char particles; wherein (c) the reactive char particles from (b) are heated to still higher temperature to reduce the volatile content of the char to less than about 5% and produce a reactive coal calcinate; wherein (d) the reactive coal calcinate is mixed with bituminous binder and wherein (e) the mixture from (d) is briquetted, cured and coked; the improvement of producing medium BTU by product gas while maintaining coke quality comprising the steps:

A. carrying out carbonization and calcining steps (b) and (c) in a fluidized bed in which the fluidizing gas introduced consists of pure oxygen diluted with steam or carbon dioxide while the temperature of step (c) is maintained below that at which substantial gasification occurs;

B. collecting gaseous overheads from steps (b) and (c);

C. separating the diluent from the overheads; and

D. recovering medium BTU gas therefrom.

4,288,294

METHOD FOR THE COOLING OF SOLID RESIDUES OF GASIFICATION

Günter Velling, Rheinstrasse 236, 5303 Bornheim-Hersel, Fed. Rep. of Germany

Filed Dec. 17, 1979, Ser. No. 104,249

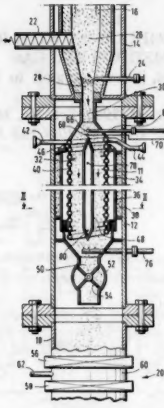
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856059

Int. Cl.[3] C10B *39/02, 39/04*

U.S. Cl. 201—39 **7 Claims**

1. A method of cooling the solid residues of gasification of a reactor operated at a pressure above atmospheric for the gasification of carbonaceous materials, wherein the residues of gasification are conducted out of the reactor into a cooling apparatus located therebelow which forms a pressure system with said reactor, and flow through the cooling apparatus from the top to the bottom thereof, cooling liquid being introduced into the solid residues of gasification in the upper region of the cooling apparatus and being metered such that the greater portion of the heat contained in the residue is eliminated in the form of heat of vaporization and sensible heat and chemical

binding energy with the resultant steam and the reaction products produced, and the remaining residual quantity of heat, which corresponds to the difference between the desired final



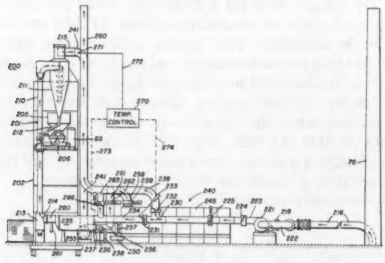
temperature and the temperature after cooling by the liquid, is eliminated by gas which is blown into the bottom region of the cooling apparatus and by indirect heat exchange.

4,288,295

COKE OVEN WITH APPARATUS FOR PARTIALLY DRYING AND PREHEATING COAL

Brian W. H. Marsden, Palos Heights, Ill., assignor to Interlake, Inc., Oak Brook, Ill.

Filed Jun. 12, 1979, Ser. No. 47,871
Int. Cl.³ C10B *45/00*
U.S. Cl. 202—150 **11 Claims**



1. In a coke oven including a coking chamber, a combustion chamber in heat transfer relation to the coking chamber and having a fuel inlet and a heated air inlet and a high temperature flue gas outlet, a heat exchanger associated with the combustion chamber including a cold air inlet and a heated air outlet communicating with the heated air inlet and a high temperature flue gas inlet communicating with the high temperature flue gas outlet and an intermediate temperature flue gas outlet, the heat exchanger heating the inlet air using the energy in the high temperature flue gases to provide heated air for the combustion chamber and cooling the high temperature flue gases to an intermediate temperature, a chimney having the lower end thereof connected by a conduit to the intermediate temperature flue gas outlet, and coal transport mechanism for conveying coal to the coking chamber; apparatus for preheating and partially drying coal comprising a coal dryer having an inlet for wet coal and an outlet for partially dried and preheated coal and an inlet for intermediate temperature flue gases and an outlet for low temperature flue gases, a pipe interconnecting the conduit and said inlet for intermediate temperature flue gases, sensing means coupled to said outlet for low temperature flue gases for sensing the temperature of the flue gases leaving said coal dryer, valve mechanism associated with the conduit and said pipe for diverting at least a portion of the intermediate temperature flue gases to said coal dryer, the flue gases in said coal dryer being in heat exchange relation with the wet coal in said coal dryer partially to dry the coal to a water content of a few percent by weight and to preheat the coal to a temperature below the boiling point of water, a supplemental heater in heat exchange relationship with the intermediate temperature flue gases in said pipe for increasing the temperature of the intermediate temperature flue gases when the moisture content of the wet coal at the coal inlet to said coal dryer is above about 8% by weight, and control mechanism connected to said sensing means and to said valve mechanism and to said supplemental heater responsive to the temperature of the gases leaving said coal dryer for controlling the amount of intermediate temperature flue gas diverted to said coal dryer and the operation of said supplemental heater, said control mechanism operating said valve mechanism to increase the amount of the intermediate temperature flue gases diverted to said coal dryer when the temperature of said low temperature flue gases leaving said coal dryer is below a predetermined temperature range and to decrease the amount of intermediate temperature flue gases diverted to said coal dryer when the temperature of said low temperature flue gases leaving said coal dryer is above said predetermined temperature range, said control mechanism actuating said supplemental heater in response to a temperature of the flue gases leaving said coal dryer above said predetermined temperature range when said valve mechanism is in a condition for diverting substantially all of said intermediate flue gases to said coal dryer, the coal transport mechanism conveying the partially dried and preheated coal to the coking chamber for the coking thereof to produce coke with a high stability index at a fuel savings with high coking productivity.

4,288,296

DECOMPOSITION INHIBITORS FOR HIGH TEMPERATURE STORAGE AND DISTILLATION OF CHLORINATED PHENOLS

Leonard R. Thompson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 23,867, Mar. 26, 1979, abandoned. This application Feb. 1, 1980, Ser. No. 117,733
Int. Cl.³ B01D *3/34;* C07C *37/74, 39/36*
U.S. Cl. 203—6 **10 Claims**

1. A process for inhibiting the decomposition of chlorinated phenol during exposure to high temperatures, which comprises adding at least 0.25 percent by weight of said chlorinated phenol of at least one primary alcohol having at least 14 carbon atoms, one hydroxyl group, and devoid of any other heteroatoms and ether linkages, selected from the group consisting of straight-chain or branched monohydric primary alcohols and mixtures of said straight-chain or branched monohydric primary alcohols.

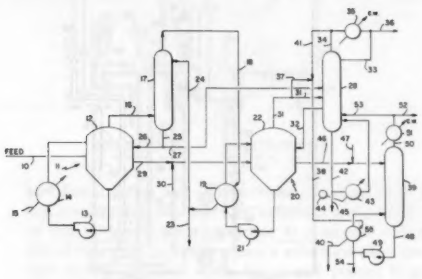
6. A process for purifying impure chlorinated phenol which comprises distilling said chlorinated phenol at subatmospheric pressures in the presence of at least about 0.25 percent by weight of said impure chlorinated phenol of at least one primary alcohol having at least 14 carbon atoms, one hydroxyl group, and devoid of any other heteroatoms and ether linkages, selected from the group consisting of straight-chain monohydric primary alcohols, branched monohydric primary alcohols and mixtures thereof, thereby separating said chlorinated phenol from higher boiling impurities.

4,288,297

PROCESS FOR RECTIFICATION OF MISCELLA FROM EXTRACTION OF OLEAGINOUS SEEDS

George B. Karnofsky, Pittsburgh, and John Slovski, Allison Park, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 745,397, Nov. 26, 1976, abandoned.
This application Apr. 14, 1980, Ser. No. 140,151
Int. Cl.[3] B01D *3/14*
U.S. Cl. 203—81 8 Claims



1. A process for distilling a miscella including dissolved carbohydrates obtained by extracting oleaginous seed material with alcohol solutions to recover a dilute alcohol solution and a concentrated alcohol solution while minimizing foaming which comprises:

(a) introducing said miscella into a first vapor/liquid separation;

(b) withdrawing and heating a liquid stream from said first vapor/liquid separation zone and introducing said heated liquid stream into said vapor/liquid separation zone;

(c) withdrawing a vapor stream from said first vapor/liquid separation zone and introducing said vapor stream into a first rectification zone;

(d) contacting said vapor stream of step (c) in said first rectification zone with a liquid stream to separate a lower boiling component from said liquid stream;

(e) withdrawing a vapor stream from said first rectification zone;

(f) condensing said vapor stream of step (e) to form a condensate;

(g) passing a portion of said condensate to said rectification zone as said liquid stream of step (d);

(h) recovering a remaining portion of said condensate as a concentrated alcohol solution;

(i) withdrawing a net liquid stream from said first vapor/liquid separation zone and introducing said net liquid stream into a second vapor/liquid separation zone;

(j) withdrawing and heating a liquid stream from said second vapor/liquid separation zone and introducing said heated liquid stream into said second vapor/liquid separation zone;

(k) withdrawing a vapor stream from said second vapor/liquid separation zone and introducing a portion of said vapor stream into a second rectification zone;

(l) contacting said vapor stream of step (k) in said second rectification zone with a liquid stream to separate a lower boiling component of said liquid stream;

(m) withdrawing and condensing a vapor stream from said second rectification zone to form a condensate of concentrate alcohol solution;

(n) withdrawing a net liquid stream from said second vapor/liquid separation zone and introducing said net liquid stream from said second vapor/liquid separation zone into a stripping zone;

(o) contacting said net liquid stream in said stripping zone with a vapor stream to separate a lower boiling component from said liquid stream;

(p) withdrawing and condensing a vapor stream from said stripping zone as said dilute aqueous alcohol solution; and

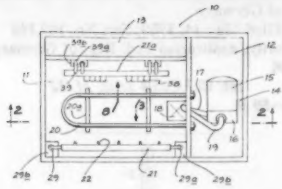
(q) withdrawing a liquid bottom stream from said stripping zone, said liquid bottom stream containing said carbohydrates in a concentration of no more than 30 percent by weight.

4,288,298

METHOD AND APPARATUS FOR ELECTROPLATING OR ELECTROFORMING METAL OBJECTS

Olbert W. Rogers, 70 Gymea Bay Rd., Gymea, New South Wales, Australia 2227

Filed Mar. 11, 1980, Ser. No. 129,293
Claims priority, application Australia, Mar. 14, 1979, PD8025
Int. Cl.[3] C25D *1/00, 5/00, 17/06, 17/10*
U.S. Cl. 204—4 5 Claims



1. An apparatus for use in electrodeposition of a metal onto a chosen variable number of substrates, which comprises

a retainer for an electrolyte,

a first electrode member having means for supporting said plurality of substrates within said retainer,

a second electrode member comprising a non-conductive panel having mounted thereon a plurality of metal baskets, each metal basket being for containing in electrical connection therewith a piece of said metal to be electrodeposited,

connecting means for mounting the first electrode member in the retainer and intended for connecting the first electrode member to one pole of a direct current supply,

mounting means for mounting the second electrode member in the retainer, and

means for making selective connection of a number of the metal baskets to the other pole of the direct current supply, the remaining baskets not being connected to the supply.

4,288,299

ENHANCED HYDROTHERMAL SEALING OF ANODIZED ALUMINUM

Bryan G. Carter, Banbury, England, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed May 11, 1979, Ser. No. 38,125
Claims priority, application United Kingdom, May 22, 1978, 21032/78
Int. Cl.[3] C25D *11/18*
U.S. Cl. 204—35 N 14 Claims

1. In a method for producing hydrothermally sealed anodized aluminum including

initially establishing an anodic oxide coating on a substrate of aluminum or aluminum base alloy; and,

subsequently hydrothermally sealing the coating by subjecting the established anodic oxide coating on the substrate to hydrothermal sealing conditions in the presence of an amount of smut-inhibiting agent effective in inhibiting formation of smut incident to hydrothermal sealing, said smut-inhibiting agent being an agent for suppressing formation of crystalline boehmite particles on the surface of the anodic coating while permitting hydration to take place in the pores of the coating, the improvement which comprises:

promoting the hydrothermal sealing of the anodized aluminum by pretreating the established anodic oxide coating prior to hydrothermal sealing, with a basic aqueous medium at a pH in the range of about 7 to about 11 and a temperature of from about 20° C. to about 80° C. for up to about 30 minutes, the combination of said conditions being effective to enhance and promote sealing of said anodic oxide coating during the subsequent hydrothermal sealing step, but below those required to effect substantial sealing of the coating.

4,288,300

PROCESS FOR THE MANUFACTURE OF N-α-ALKOXYETHYL-CARBOXYLIC ACID AMIDES

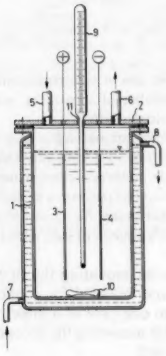
Michael Mitzlaff, Bad Homburg; Jürgen Cramer, Eppstein, and Rudolf Pistorius, Ober-Mörlen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 14, 1980, Ser. No. 149,149

Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919756

Int. Cl.³ C25B *3/02, 11/12*

U.S. Cl. 204—59 R **13 Claims**



1. A process for the manufacture of N-α-alkoxyethylcarboxylic acid amides in an electrolysis solution which comprises alkoxylation of an N-ethyl-carboxylic acid amide with an alcohol in an electrolytic cell equipped with an anode and a cathode in the presence of a supporting electrolyte, using vitreous carbon as anode material and at least one alkali metal, or tetraalklammonium alkosulfate as supporting electrolyte.

4,288,301

METHOD OF FORMING HYDROGEN

Thomas G. Hart, Royal Oak, Mich., assignor to Energy Development Associates, Inc., Southfield, Mich.

Division of Ser. No. 925,980, Jul. 19, 1978. This application Oct. 18, 1979, Ser. No. 86,258

Int. Cl.³ C25B *1/26, 1/02, 1/00*

U.S. Cl. 204—101 **3 Claims**

1. A method of producing hydrogen by electrolysis of a water base electrolyte using oxidation of ungraphitized carbon particles in said solution as an input energy source, said method comprising the steps of:

(a) providing an electrolysis cell with a first electrode and a second electrode;

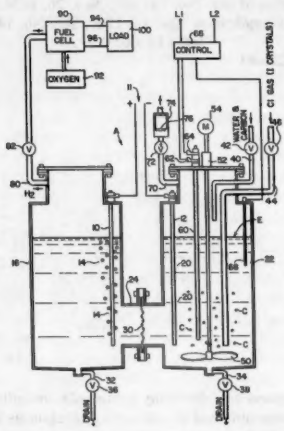
(b) providing a gas collecting chamber in said cell and adjacent each of said electrodes;

(c) providing a water base electrolyte in said cell and communicated with both said first and second electrodes;

(d) periodically adding water to said electrolyte;

(e) periodically adding oxidizable ungraphitized carbon particles to said electrolyte adjacent at least said first electrode;

(f) applying a direct current across said electrodes at a voltage at least as great as said decomposition voltage of said electrolyte;



(g) collecting hydrogen in said chamber adjacent said second electrode; and,

(h) collecting an oxide gas of carbon in said chamber adjacent said first electrode.

4,288,302

METHOD FOR ELECTROWINNING METAL

Vittorio de Nora, Nassau, The Bahamas; Giuseppe Bianchi, and Antonio Nidola, both of Milan, Italy, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Division of Ser. No. 436,687, Jan. 25, 1974, abandoned. This application Jan. 31, 1977, Ser. No. 763,889

Claims priority, application Italy, Jan. 26, 1973, 19679 A/73

Int. Cl.³ C25B *1/02;* **C25C** *1/00;* **C25B** *11/10*

U.S. Cl. 204—105 R **12 Claims**

1. In the method of electrowinning metals from an aqueous acid electrolyte solution containing dissolved metals therein in an electrolysis cell containing a cathode, and means to pass an electrolysis current through said cell between an anode and a cathode, the novel steps which comprise inserting an anode comprising titanium alloyed with 1 to 50% by weight of at least one metal from Groups VIB, VIIB, VIII, IIB, IB, IVA and lanthanum and lanthanide series of the Periodic Table into said electrolyte and passing an electrolysis current through said cell to release oxygen at said anode and deposit dissolved metal from said solution on the cathode.

4,288,303

ELECTROCHEMICAL PROCESSING SYSTEM

Wayne R. Matson, Ayer, Mass., assignor to Environmental Sciences Associates, Inc., Bedford, Mass.

Division of Ser. No. 953,335, Oct. 20, 1978, Pat. No. 4,226,695. This application Nov. 29, 1979, Ser. No. 98,689

Int. Cl.³ C25C *1/00;* **C02F** *1/46*

U.S. Cl. 204—105 R **23 Claims**

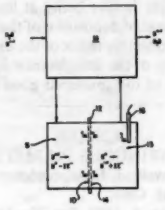
1. In a method for electrochemically treating a first solution containing a selected material so as to effect a desired change in said first solution, said method comprising the steps of:

passing said first solution in contact with one side of a porous membrane under electrochemical conditions such that said selected material reacts to produce a first product;

passing said deposited first product through said porous membrane to the other side thereof; and

reacting said first product in a second solution in contact with said other side to produce a second product;

the improvement which comprises providing as said porous membrane a porous bi-polar electrode, maintaining one side of said porous bi-polar electrode at a first predetermined electrical potential versus a reference electrode in



said first solution and electrochemically depositing said first product onto said one side, maintaining the other side of said porous bi-polar electrode at a second predetermined electrical potential verses a reference electrode in said second solution, while fixing said porous bi-polar electrode at ground.

4,288,304

HYDROMETALLURGICAL PROCESS FOR TREATMENT OF SULPHUR ORES

Jean-Michel DeMarthe, Viroflay; Louis Gandon, and Andre Georgeaux, both of Rambouillet, all of France, assignors to Societe Miniere et Metallurgique de Penarroya, Paris, France

Continuation of Ser. No. 677,515, Apr. 16, 1976, abandoned.
This application May 15, 1980, Ser. No. 150,179
Claims priority, application France, Apr. 21, 1975, 75 12373
Int. Cl.[3] C22B *19/26, 13/08, 11/04*
U.S. Cl. 204—111 **69 Claims**

1. A hydrometallurgical process for treating a sulphur- and zinc-containing ore or concentrate to recover zinc therefrom, which process comprises the following three steps:

(a) leaching the ore or concentrate with an aqueous solution of cupric chloride thereby forming cuprous chloride;

(b) subjecting the solution thus obtained to liquid-liquid extraction by means of an organic phase to oxtract zinc into the organic phase while concurrently oxidizing cuprous chloride to cupric chloride; and

(c) recovering the zinc extracted into the organic phase.

48. A hydrometallurgical process for treating a sulphurized ore or concentrate containing iron and rich in zinc and copper, in the form of their sulphides to recover the sulphur, iron, zinc, and copper values therefrom, comprising:

(a) leaching the ore or concentrate with an aqueous solution of cupric chloride whereupon the zinc and copper sulphides are converted to soluble zinc and cupric chlorides, the cupric chloride is reduced to cuprous chloride, and elemental sulphur is produced;

(b) separating the sulphur and any unreacted residue from the reaction mixture;

(c) regenerating the resulting solution, in situ, at atmospheric pressure, with air and a regenerating agent selected from the group consisting of hydrochloric acid and ferrous chloride to oxidize the cuprous chloride to cupric chloride so as to provide a concentration of cuprous ions exceeding 1 gram per liter in the resulting aqueous solution of cupric chloride which is recycled for additional leaching to step (a) and the iron is precipitated as goethite and separated from the aqueous solution;

(d) subjecting the resulting aqueous solution, now free of sulphur, residue, and iron, and containing zinc and copper chlorides to liquid-liquid extraction with a neutral organic zinc extracting agent to obtain an organic phase containing the extracted zinc and an aqueous phase containing copper chlorides;

(e) recovering the zinc from the organic phase and recycling the zinc-free organic phase to step (d);

(f) subjecting the aqueous phase containing copper chlorides to liquid-liquid extraction with an organic copper-extraction cationic agent to obtain an organic phase containing the copper, the acidity released by this extraction being absorbed by the regeneration of cupric chloride; and

(g) recovering the copper from the organic phase and recycling the copper-free organic phase to step (f).

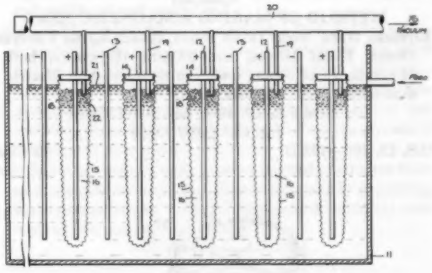
60. A process for extracting zinc from an aqueous solution containing zinc and copper in which at least a portion of the copper is present as cuprous ions comprising contacting the aqueous solution with an organic phase containing a cationic extraction agent having an affinity for zinc while concurrently oxidizing the cuprous ions in the aqueous solution to cupric ions.

4,288,305

PROCESS FOR ELECTROWINNING NICKEL OR COBALT

Petrus G. S. Garritsen, Welland; Douglas J. MacVicar, Port Colborne; Daniel P. Young, Sherkston, and John G. Sojda, Welland, all of Canada, assignors to Inco Limited, Toronto, Canada

Filed Aug. 18, 1980, Ser. No. 178,819
Claims priority, application Canada, Oct. 10, 1979, 337248
Int. Cl.[3] C25C *1/08;* **C25B** *15/08*
U.S. Cl. 204—112 **5 Claims**



1. In a process wherein nickel or cobalt is electrowon from an electrolyte in apparatus having alternately spaced insoluble anodes and cathodes, each anode being provided with diaphragm means for defining an anolyte compartment surrounding the submerged portion of the respective anode, and wherein feed electrolyte is introduced into the space between anolyte compartments and spent electrolyte is withdrawn from within each anolyte compartment, the improvement consisting of including in the feed electrolyte an amount of frothing agent sufficient to ensure the formation of a stable froth at least 3 centimeters thick on the electrolyte surface within the anolyte compartments, and withdrawing froth continuously from each of the anolyte compartments, thereby simultaneously withdrawing from the apparatus spent electrolyte and anodically generated gases.

4,288,306

PROCESS FOR FORMING A METAL OR ALLOY LAYER AND DEVICE FOR EXECUTING SAME

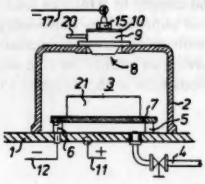
Wolfgang Kieferle, Lindenstrasse 23, D 7981 Grünkraut, and Franz Wäschle, Brucknerstrasse 16, D 7987 Weingarten, both of Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 56,121

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1978, 2830134

Int. Cl.[3] C23C *11/02, 15/00*

U.S. Cl. 204—192 R 4 Claims



1. A process for coating a metal or alloy layer on an electricity-conducting work piece by means of a glow discharge, wherein the work piece is connected as one electrode of an electric field in a low-pressure chamber loaded with carrier gas and the material to be coated or spender medium is connected as the other electrode, wherein the carrier gas and the spender medium are preionized and are transferred into the electric field of the low-pressure chamber in ionized state, characterized by the fact that an arc discharge is utilized for the explosive spattering of spender medium with the aid of a carrier gas put into turbulence, and this arc discharge is superposed on a glow discharge, and energy is additionally imparted to the preionized metal ions of the spender medium by making use of the cathode fall of potential, and these metal ions of high velocity are coated or deposited on the work piece connected as the first electrode.

4,288,307

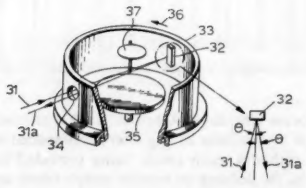
METHOD OF MAKING A MAGNETIC HEAD

Kiyotaka Wasa, Nara; Takao Tohda, Ikoma; Kazuo Yokoyama, Osaka; Eiichi Hirota, and Shigeru Hayakawa, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 19, 1980, Ser. No. 122,809

Int. Cl.[3] C23C *15/00*

U.S. Cl. 204—192 D 13 Claims



1. A method of making magnetic head core pieces for use in making a magnetic gap formed by cementing together a pair of magnetic head core pieces at least one of which has the face within the joint coated with glass, said method comprising: depositing a glass layer on a surface of a magnetic head core piece made of a magnetic head core material by a cathodic sputtering of a glass target means by mounting said piece in a sample holder and, while carrying out said sputtering, rotating the sample holder around the target means with the surface of said piece facing in a direction lateral to the target means; positioning a mask plate between said target means and the circumferential path of said piece for preventing an excess of sputtered glass from being deposited onto said piece; and monitoring the thickness of the sputtered glass layer formed on said piece by directing a light beam of a wavelength λ directly onto said surface of said piece in a direction for producing an interference light beam reflected from said piece, the speed of rotation of said sample holder being at least 50 $^{V}dep/n\lambda$, in which ^{V}dep is the speed of deposition of the sputtered glass per minute and n is the refractive index of the deposited glass layer, whereby the intensity of the interference light beam is indicative of the thickness of the sputtered glass layer.

4,288,308

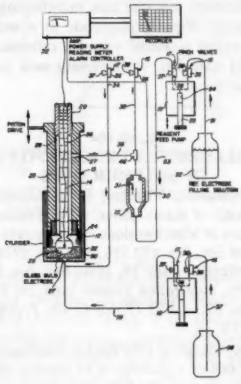
CONTINUOUS PH METER

Clifford C. Hach, Loveland, Colo., assignor to Hach Chemical Company, Loveland, Colo.

Filed Jun. 6, 1980, Ser. No. 156,936

Int. Cl.[3] G01N *27/38*

U.S. Cl. 204—195 R 6 Claims



1. A pH meter comprising, in combination, a frame, a sample chamber mounted on said frame, a reference electrode mounted in fluid communication with said chamber, a piston mounted in said chamber and including a glass electrode to cooperate with said reference electrode for measuring the pH of liquid samples in the chamber, intake and outlet lines opening to said chamber, valves on said frame for each of said lines, means for reciprocating said piston in said chamber and operating said valves so that the outlet line is open and the intake line closed as the piston fills the chamber to exhaust fluid from the chamber and the intake line is open and the outlet line closed as the piston withdraws from the chamber and draws a new liquid sample into the chamber, said reference electrode mounting including an electrolyte line opening into said outlet line, a positive displacement pump in said frame driven by said means, said pump being connected to deliver controlled amounts of electrolyte past said reference electrode so as to maintain a flow of electrolyte into said outlet line, and a body of deformable material in said chamber and positioned to engage and clean said glass electrode each time said piston is reciprocated.

4,288,309

ELECTROLYTIC DEVICE

Samuel Cohen, Paris, France, assignor to Ecopol, Paris, France

Filed Dec. 17, 1979, Ser. No. 104,688

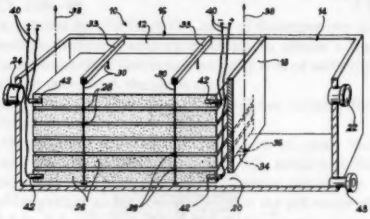
Claims priority, application France, Dec. 20, 1978, 78 35830

Int. Cl.[3] C25B *9/02, 11/02, 15/04*

U.S. Cl. 204—225 20 Claims

1. An electrolytic device, wherein said device comprises a

tank adapted to contain electrolyte, flat electrodes which are stacked horizontally so as to rest one upon another under the action of gravity and at least a certain number of which are consumable, two successive electrodes being separated by spacer elements having the same thickness and formed of



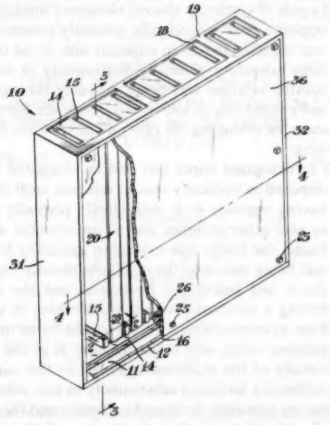
material which is inert to electrolysis so that the contact surfaces between the spacer elements and the electrodes permit substantially uniform erosion of the consumable electrodes over their entire surface and the spacing between two consecutive electrodes thus remains constant.

4,288,310

MEMBRANE SUPPORT ASSEMBLY FOR ELECTROLYTIC CELL AND METHOD OF MAKING SAME

Allan R. Knight, 437 Crescent Park, Petrolia, Ontario N0N 1R0, Canada, and Indresh Mathur, 939 Cathcart Blvd., Sarnia, N7V 2P1 Ontario, Canada

Filed Sep. 12, 1979, Ser. No. 74,640
Int. Cl.³ C25B *9/00, 13/02, 13/08, 1/16*
U.S. Cl. 204—252 **15 Claims**



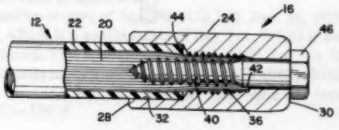
1. In an electrolytic cell for the production of chlorine and caustic from aqueous alkali metal chloride solutions comprising a plurality of cathodes spaced from one another and a plurality of anodes interposed between said cathodes and spaced therefrom, an improved membrane support assembly which comprises a continuous, elongated sheet of preformed membrane positioned in serpentine fashion between the anodes and the cathodes so as to separate all opposing surfaces of anodes and cathodes, a first membrane support plate cast in situ embedding one serpentine-shaped edge of said membrane, and a second membrane support plate cast in situ embedding the other serpentine-shaped edge of said membrane, said membrane support assembly dividing said electrolytic cell into separate anolyte and catholyte compartments.

4,288,311

CONTACTOR AND DANGLER ASSEMBLY FOR PLATING BARREL

Albert Singleton, 7360 Brookside Pkwy., Middleburg Heights, Ohio 44130, and Raymund Singleton, North Ridgeville, Ohio, assignors to Albert Singleton, Cleveland, Ohio

Filed Jan. 18, 1980, Ser. No. 113,220
Int. Cl.³ C25D *17/00, 17/20;* **H01R** *4/24*
U.S. Cl. 204—279 **13 Claims**



1. A dangler assembly for an electro-chemical apparatus comprising in combination:

an elongated electrical conductor, an insulating sheath closely surrounding said conductor, an electrical connector disposed at one terminal end of said conductor, and, a contactor disposed at the opposite terminal end of said conductor;

said contactor comprising a generally cylindrical open ended casing having opposed inner and outer ends with a first bore section extending axially thereinto from said outer end receiving a longitudinal portion of said electrical conductor and insulating sheath adjacent said conductor opposite terminal end, a second bore section communicating with said first bore section extending further axially into said casing toward said inner end, having a threaded side wall at least substantially over the length thereof, and receiving a portion of the length of said conductor at said conductor opposite end, a third bore section communicating between said second bore section and said casing inner end axially of said casing and

elongated fastening means, comprising a threaded lag screw extending from said casing inner end through said third and said second bore sections and through at least a portion of said first bore section to penetrate at least a portion of said conductor received in said first bore section, and including threads of the opposite hand from the threads of said second bore section side wall;

said fastening means axially penetrating said conductor from said opposite terminal end thereof for radially expanding said conductor into retained engagement with the side wall of said second bore section.

4,288,312

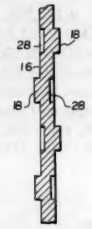
CATHODE AND EDGE STICK ASSEMBLY

Ralph E. Johnson, and Reno P. Biscaro, both of Trail, Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Nov. 30, 1979, Ser. No. 99,030
Claims priority, application Canada, Aug. 13, 1979, 333639
Int. Cl.³ C25C *7/02;* **C25D** *17/10*
U.S. Cl. 204—281 **14 Claims**

1. A cathode assembly for the electrodeposition of metals comprising in combination at least one edge stick engaging at least one edge of a cathode, wherein the cathode has at least one upstanding projection on each of its surfaces proximate said edge, the projections each having an upstanding face which is both substantially parallel to the proximate cathode edge and facing away therefrom, and wherein the non-conductive plastic edge is of channel-like form, the inner trough faces of the channel being provided with projecting lips at their

outer edges adapted to move over the projections on each surface of the cathode proximate the cathode edge and to



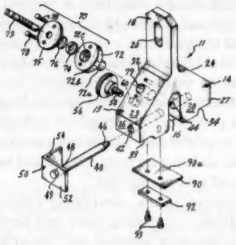
engage opposite cathode faces resiliently and securely, thereby to retain the edge stick thereon.

4,288,313

HANGER FOR HANDLING SHEET MATERIAL DURING PROCESSING THEREOF

Odo S. Bormke, Gig Harbor, and Ronald L. Bunch, Tacoma, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 9, 1980, Ser. No. 138,665
Int. Cl.[3] C25B 9/02; C25D 17/08
U.S. Cl. 204—297 W **17 Claims**



1. An electrically conductive hanger for engaging sheet metal material from an upper edge portion thereof and for cooperating with an overhead hanger support fitting and with spaced parallel hanger supports so as to supportively hang such material during handling and electroprocessing thereof, in which such sheet metal material has a hanger cooperating opening provided adjacent such upper edge portion, comprising:

an inverted Y-shaped body made of electrically conductive material and including a downwardly oriented bifurcation that forms first and second legs that bound a centrally located sheet receiving slot, feet means formed on said legs adapted for suportively resting on spaced parallel hanger supports, and an upwardly projecting attachment portion adapted for receiving a cooperating hanger support fitting;

releasable shear pin means cooperating with said legs and slot for releasably hanging the sheet metal material by engaging an opening provided in such sheet material adjacent an upper edge portion thereof when such upper edge portion is disposed in said receiving slot of said body; and,

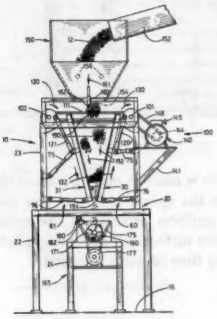
clamping screw means cooperating with said body and slot therein for jamming a surface of such sheet material when disposed in said slot, against an interior wall of said slot.

4,288,314

APPARATUS FOR SEPARATING ADHERING DRIED FRUITS AND THE LIKE

Edward J. Derderian, 4514 N. Wilson Ave., Fresno, Calif. 93704

Filed Sep. 2, 1980, Ser. No. 182,953
Int. Cl.[3] B07B 13/16
U.S. Cl. 209—3 **6 Claims**



6. An apparatus for separating clumps of adherent dried fruit and the like comprising:

A. a frame having opposite sides;

B. a pair of substantially planar downwardly convergent friction members;

C. means mounting one of the members in the frame between the sides thereof comprising

(1) a pair of vertically spaced, elongated links each having opposite ends individually pivotally connected to said one member and to an adjacent side of the frame, such links extending generally horizontally in substantially parallel relation and being movable through substantially equal angles above and below the horizontal;

D. means for mounting the other member in the frame comprising:

(1) an elongated upper link and an elongated lower link disposed in vertically spaced relation, each of said links having opposite ends individually pivotally connected to said other member and to an adjacent side of the frame, the lower link extending generally horizontally and being movable through substantially equal angles above and below the horizontal and the upper link having a substantial upward inclination in a direction from its connection to the side of the frame to said other member when said other member is at the lower extremity of the movement thereof so that said upward inclination increases substantially as said other member moves upwardly from said extremity and the upper end of said other member moves toward the side of the frame to which it is connected and so that said upward inclination decreases substantially as said other member moves downwardly toward said extremity and said upper end moves away from the side of the frame to which it is connected;

E. drive means for alternately and oppositely elevationally reciprocating said members;

F. means for supplying clumps of fruit between said members for separation by rubbing action of the friction members thereagainst; and

G. means disposed beneath said members for receiving separated fruit therefrom.

4,288,315

BENEFICATION OF FLUORSPAR ORES

John C. Morrisey, IV, Beckley, W. Va., and Ulus R. Smith, Cave-In-Rock, Ill., assignors to Allied Corporation, Morris Township, N.J.

Filed Mar. 26, 1979, Ser. No. 24,215
Int. Cl.[3] B02B 1/02
U.S. Cl. 209—11 3 Claims

1. A process for the froth flotation of fluorspar ore containing metallic sulfide accessory minerals to obtain a fluorspar enriched concentrate that is substantially free of sulfide impurities, which comprises the steps of:

a. preparing an aqueous pulp of said ore suitable for froth flotation;

b. conditioning the pulp with flotation reagents including oleic acid as a collector for said ore, sodium sulfide as a depressor for metallic sulfides, gangue depressors, and a pH regulator to maintain the pulp in the pH range of about 8.5 to 9.5 while heating the pulp to a temperature in the range of about 85° to 105° F. (29° to 41° C.); and

c. subjecting the conditioned pulp to froth flotation and recovering a fluorspar enriched concentrate having a fluorspar content of at least about 96.5 wt. % and a sulfide sulfur content not greater than about 0.02 wt. %;

wherein: said ore includes about 30 to 60 wt. % fluorspar, up to about 3 wt. % metallic sulfides, and up to about 55 wt. % gangue including silica, calcite, and barite;

said pulp has a solids content of about 35 to 45 wt. % with a particle size of less than about 48 mesh;

said gangue depressors are an alkali metal silicate, starch, and quebracho, each added to said pulp at an addition rate of about 1 to 5 pounds per ton of ore (0.5 to 2.5 kg/tonne), and said pH regulator is soda ash;

said oleic acid is added to said pulp at an addition rate of about 0.5 to 1.5 pounds per ton of ore (0.25 to 0.75 kg/tonne); and

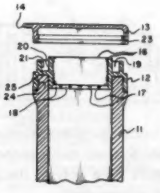
said sodium sulfide is added to said pulp at an addition rate of about 0.05 to 0.4 pound per ton of ore (0.025 to 0.2 kg/tonne).

4,288,316

FECAL EXAMINING DEVICE

Michael J. Hennessy, 1673 E. Oak Rd., Vineland, N.J. 08360

Filed Feb. 21, 1980, Ser. No. 123,370
Int. Cl.[3] B03B 7/00
U.S. Cl. 209—17 14 Claims



1. A fecal examining device to support an ova-collecting slide whereby the slide receives and collects ova upwards through a liquid-fecal material mixture comprising:

(a) a vial for holding a sample of feces to be examined,

(b) a tubular extension with an upper edge of the extension constructed to receive the ova-collecting slide wherein a lower portion of the tubular extension is connected to the vial opening by a sealable fit means to sealably connect the parts and expand the internal volume of the device upwardly to the extent of the internal volume of the tubular extension, and

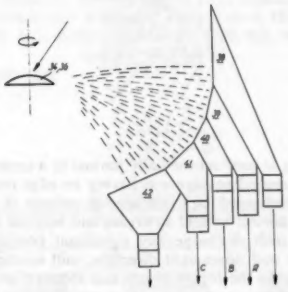
(c) a screen means immovably affixed across the internal volume of the tubular extension wherein the screen means comprises a plurality of said guards providing an essentially clear vertical flow area upwardly of at least 40% of the screen area.

4,288,317

METHOD AND A SYSTEM FOR SEPARATING AN AQUEOUS SUSPENSION CONTAINING FIBROUS PARTICLES INTO FRACTIONS OF DIFFERENT AVERAGE CHARACTERISTICS

Alfonso de Ruvo, Stockholm; Bo Norman, Johanneshov, both of Sweden; Geoffrey G. Duffy, Aukland; Klaus Moller, Hamilton, both of New Zealand; Karl E. Hansen, Kokkedal, Denmark; Karsten S. Felsvang, Allerod, Denmark, and Erik Liborius, Charlottenlund, Denmark, assignors to A/S Niro Atomizer, Søborg, Denmark

Continuation-in-part of Ser. No. 872,714, Jan. 26, 1978, abandoned, which is a continuation of Ser. No. 708,441, Jul. 23, 1976, abandoned. This application May 11, 1979, Ser. No. 38,045
Claims priority, application Sweden, Jul. 29, 1975, 7508592
Int. Cl.[3] B07B 7/083
U.S. Cl. 209—139 A 17 Claims



1. A method for separating an aqueous suspension containing fibrous particles into fractions of different average characteristics with respect to particle size and shape, comprising the steps of

supplying the suspension to a separator disc having a concave surface with a solid matter concentration not exceeding 10 percent by weight, said separator disc rotating in a substantially horizontal plane at a circumferential velocity sufficiently great that a film of said suspension formed on said concave surface is accelerated towards the disc circumference in a continuous flow in which fractions of the suspension having said different average characteristics are separated from each other and at the circumference of the disc said film is broken up and said separated fractions dispersed outwardly from the disc in different directions in a dense mist of particles and atomized water droplets in air, and

collecting said fractions in a number of collecting zones disposed in different vertical portions relative to said disc.

4,288,318

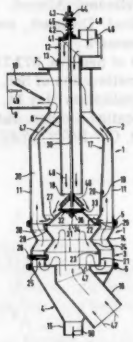
PNEUMATIC SEPARATOR FOR FLOWABLE PARTICULATE MATERIALS

Wolfgang Essmann, and Kurt Schnellbacher, both of Brunswick, Fed. Rep. of Germany, assignors to Bühler-Miag GmbH, Brunswick, Fed. Rep. of Germany

Filed Jul. 7, 1980, Ser. No. 166,457
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929672
Int. Cl.[3] B07B 4/02
U.S. Cl. 209—139 R 8 Claims

1. A pneumatic separator for multi-fraction particulate pourable materials, comprising first means defining a first upright passage for admission of a multi-fraction particulate material in

downward direction and having a first open lower end; second means defining an upright annular second passage surrounding said first passage outwardly spaced therefrom and having a second open lower end downwardly spaced from said first end, said second passage having an outlet in the region of its upper end and converging in the direction towards said region; means for applying suction to said outlet to produce in said second passage an airstream flowing in upward directon and a guide body centrally located beneath said first end and having a conical surface which directs the material towards said second end, and a shoulder downwardly of said conical surface



and extending at least substantially normal to a central axis of said annular second passage and having an edge over which material is discharged into said second passage in direction substantially normal to said airstream and without having at the time of such discharge any significant componenet of movement in said downward direction, said second passage having at least in the region below said shoulder at least one zig-zag shaped passage portion so that, when suction is applied to said outlet and material is discharged into said passage portion, the material undergoes repeated directional changes during each of which the airstream aspirated by application of the suction travels transversely through the material.

4,288,319

METHOD OF AND ARRANGEMENT FOR DE-INKING FIBER

Karel A. G. Heijs; Antonius J. Dechamps, both of Gennep, and Robert L. de Jong, Boxmeer, all of Netherlands, assignors to N.V. Papierfabriek Gennep, Gennep, Netherlands

Filed Feb. 4, 1980, Ser. No. 118,590

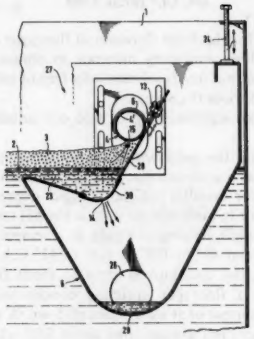
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 2904326

Int. Cl.³ B03D *1/02, 1/24*

U.S. Cl. 209—166 **14 Claims**

1. A method of de-inking pulp suspension by way of flotation comprising the steps of chemically treating the pulp suspension, supplying air at a particular level below the liquid level of the chemically treated pulp suspension thereby purifying it of suspended impurities by generating a foam containing the impurities on the surface of the liquid level of the suspension, drawing off the foam closely above the liquid level, quenching the drawn-off foam, and separately discharging, simultaneously with said drawing off step and above the level at which said air supplying step is performed, an upper layer of the pulp suspension directly beneath the liquid level thereby removing fiber fines contained in the upper layer.

5. An arrangement for de-inking a pulp suspension by way of flotation comprising a tank of given width for containing the suspension, aeration means in the bottom region of said tank for supplying air at a particular level below the liquid level of the suspension to produce a foam containing impurities on the surface of the liquid level of the suspension, means in said tank arranged to be in the region of the liquid level of the pulp suspension for discharging the impurities, said discharging means including at least one elongated drainage element arranged to extend closely above the liquid level and substantially transversely of the entire width of said tank for discharging the foam, and at least one discharge channel arranged to



extend substantially transversely of the entire width of said tank, closely below the liquid level and above the level at which air is supplied to the suspension by said aeration means, for separately discharging fiber fines contained in a layer of the pulp suspension directly beneath the liquid level.

4,288,320

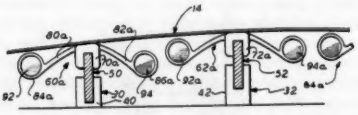
VIBRATING SCREEN WITH SCREEN DECK UNCLOGGING MECHANISM

Albert Wilson, Columbia, S.C., assignor to Litton Systems, Inc., Columbia, S.C.

Filed May 5, 1980, Ser. No. 146,251

Int. Cl.³ B07B *1/54*

U.S. Cl. 209—382 **34 Claims**



1. A screen deck unclogging mechanism; comprising:

(a) mounting means formed to be supported beneath and to aid in the support of a screen deck when disposed in proximity to the screen deck;

(b) arm means formed integral with and extending laterally to at least one side of said mounting means and so as to have a free end spaced from said mounting means;

(c) weight means disposed at said free end of said arm means;

(d) said arm means including an integrally formed springy section disposed between said mounting means and said free end; and

(e) the coaction between said weight means and said springy section of said arm means being such that when said mounting means is disposed beneath and in proximity to a screen deck and the screen deck is vibrated said weight means will rap against the underside of the screen deck to loosen material which may be lodged in the openings of the screen deck.

4,288,321

DRAIN TILE AND PILE FABRIC FILTER SLEEVE

Frank T. Beane, Rte. 7, Hwy. 49, Concord, N.C. 28025

Continuation-in-part of Ser. No. 626,630, Oct. 29, 1975, Pat. No. 4,180,464, which is a division of Ser. No. 483,391, Jun. 25, 1974, Pat. No. 3,976,578. This application Nov. 23, 1979, Ser. No. 96,643

Int. Cl.³ E02B *13/00*; B01D *29/14*

U.S. Cl. 210—170 **5 Claims**

1. In a land drainage line having an elongated flexible corrugated drainage conduit of the type having alternating peaks and valleys along its longitudinal axis and a plurality of openings through the conduit arranged along its longitudinal axis and in valleys of the conduit and a knitted fabric filter sleeve in the form of a length of tubular knit fabric having a length substantially coextensive with the length of the conduit and a diameter in relaxed condition less than the maximum diameter of the conduit, the sleeve covering the drainage conduit and filtering fine particles of soil from water passing through the sleeve and into the drainage conduit, the improvement in the knitted fabric filter sleeve comprising the fabric being formed of stitches defining a ground and defining terry loops extending from the ground and being directed in a predetermined generally radial direction relative to the longitudinal axis of the drainage conduit.

4,288,322

SAMPLE/STANDARD INJECTION HEAD FOR FLUID-PHASE CHROMATOGRAPH

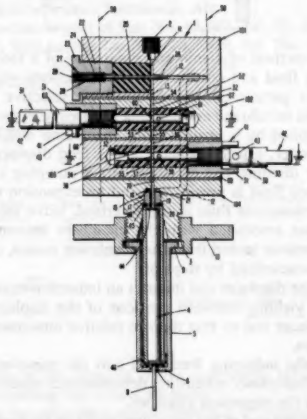
Claude Guillemin, Paris, and Christian Mayen, Creteil, both of France, assignors to Prolabo, Paris, France

Filed Sep. 29, 1980, Ser. No. 192,089

Claims priority, application France, Sep. 28, 1979, 79 25520

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—198.2 **10 Claims**



1. In a device for sweeping and injecting a sample and at least one standard into the separation column of a fluid-phase chromatograph, including (i) means for securing same to the inlet of such separation column, (ii) a supply inlet for a stream of carrier medium and means for directing said stream to said separation column, (iii) dividing means in said device for dividing said stream into primary and secondary streams, (iv) distributing means for directing said primary stream to said separation column and distributing said primary stream over the entire inlet area of said column, (v) means for directing said secondary stream axially into said separation column inlet, and (vi) means for introducing a sample into said secondary stream, the improvement which comprises (vii) means for introducing at least one standard also into said secondary stream.

4,288,323

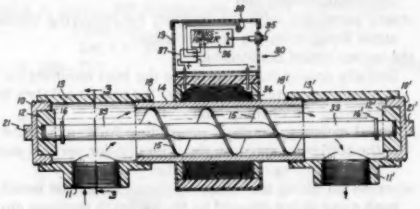
FREE FLOW NON-CORROSIVE WATER TREATMENT DEVICE

Miguel F. Brigante, 16550 NW. 10th Ave., Miami, Fla. 33169

Continuation-in-part of Ser. No. 9,669, Feb. 5, 1979, Pat. No. 4,226,720. This application May 27, 1980, Ser. No. 153,219

Int. Cl.³ C02F *1/48*

U.S. Cl. 210—222 **4 Claims**



1. In a unitary package water purification and treatment device adapted to be attached to a water appliance comprising:

a 24 volt DC power supply;

an electromagnetic coil within a housing energized by D.C. which completely encircles and extends along substantially the entire length of a centrally supported conduit pipe section;

said electromagnetic coil being fed by 24 volts D.C. to thereby induce a D.C. magnetic field within the interior of said conduit pipe section through which water flows;

an elongated shaft extending through said pipe section and having a solid helical impeller of ferromagnetic material with six to eight flights, longitudinally traversing the entire length of said electromagnetic coil;

end portions of said impeller shaft arranged centrally of said pipe section for central support on bearing bushings at opposing ends of the pipe section;

each of said bearing bushings respectively secured to externally threaded male plugs;

each of said male plugs provided with a means (central projection) for threaded installation and removal of said plugs into opposing ends of internally threaded T-shaped fittings, said T-shaped fitting secured at opposite ends of said central pipe conduit and communicating therewith to define a flow path with the helical impeller;

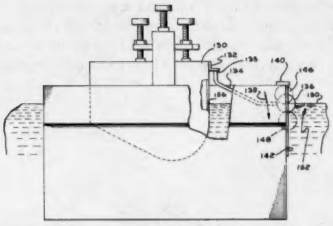
each of said T-shaped fittings includes internally threaded post means for entrance of feed water and delivery of purified water, such that the flow path is free and unobstructed from the bearings; and

each of said T-shaped fittings provided with means for a maximum flow of water through said central pipe section and free of deposits and corrosive effects.

4,288,324
SKIMMING APPARATUS

Howard D. Urdanoff, P.O. Box 3152, Bethlehem, Pa. 18017

Continuation-in-part of Ser. No. 938,644, Aug. 31, 1978, abandoned. This application Oct. 24, 1979, Ser. No. 87,745
Int. Cl.[3] E02B *15/04*
U.S. Cl. 210—242.1 10 Claims

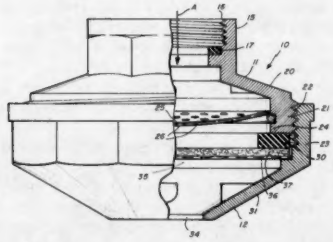


1. In a skimming system for removing a floating layer from a body of liquid which includes:
a skimmer for semi-immersion in said liquid having an inlet opening and a hollow interior compartment;
means supporting said skimmer for tilting movement from a recumbent position generally parallel with the liquid surface to an inclined position admitting the floating layer to the compartment; and
means associated with the skimmer for removing contaminated liquid from the compartment;
the improvement comprising:
laterally spaced baffles opposite the inlet mounted on the means supporting the skimmer for blocking debris from entering the opening; and
plural cleaning members protruding forwardly between the baffles mounted on the skimmer, for vertical movement with respect to the baffle;
whereby on tilting movement of the skimmer the members push away debris trapped by the baffles to facilitate movement of the floating layer to the inlet opening.

4,288,325
WATER TAP FILTER

Samuel Lieberman, Newton Centre, Mass., assignor to Thomas P. Shann, Boston, Mass.

Filed Oct. 9, 1979, Ser. No. 82,806
Int. Cl.[3] B01D *25/02*
U.S. Cl. 210—449 1 Claim

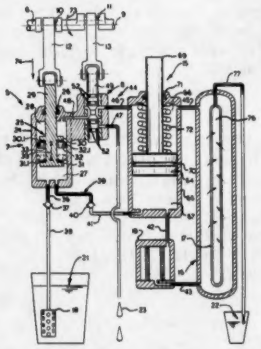


1. A filter device for attachment to a water tap nozzle comprising upper and lower components having means for selective interengagement and detachment, said upper component having means for securing to a water tap nozzle at one end and for attachment to said lower component at the other end thereof, and said upper component providing a passage for water from said tap to said lower component and having a water diffusing screen extending across said passage, said water diffusing screen being bowed to form a very shallow dome-like depending configuration, said lower component forming a passage for water from said upper component and having a single thin porous fibrous water filter pad having a thickness of several millimeters or less extending across the passage in said lower component and aligned with said screen in said upper component to receive water passing therefrom in a spray form, a supporting metal mesh screen positioned below and adjacent to said fibrous filter for support thereof, a sealing ring positioned above and in facing relation with said fibrous filter and forming a sandwich of said sealing ring, fibrous filter and mesh screen with said sandwich rigidly secured between projections extending from the internal walls of said upper and lower components, said diffusing screen spaced a distance of less than ¼ inch above said filter to substantially reduce the impact of the water spray on the porous filter, said lower component forming a chamber as means for receiving water passing through said water filter and redirecting said water from a spray form to a steady stream as it passes from said device.

4,288,326
ROTARY SHAFT DRIVEN REVERSE OSMOSIS METHOD AND APPARATUS

Bowie G. Keefer, 4324 W. 11th Ave., Vancouver, B.C., Canada (V6R 2M1)

Continuation-in-part of Ser. No. 886,429, Mar. 14, 1978, Pat. No. 4,187,173, which is a continuation-in-part of Ser. No. 782,540, Mar. 28, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,664
Int. Cl.[3] B01D *31/00, 13/00*
U.S. Cl. 210—637 34 Claims



31. A method of membrane separation of a feed fluid into permeate fluid and concentrate fluid fractions which are respectively permeated and rejected by selective membrane means, the membrane means being exposed to pressurized feed fluid supplied by a reciprocating feed pump means having a feed cylinder, a feed displacer and a feed displacer rod, the displacer dividing the cylinder into a pumping chamber in which feed fluid is pressurized and an expansion chamber in which concentrate fluid is depressurized, valve means in conduit means associated with the chambers determining fluid flow directions to and from the membrane means, the method being characterized by steps of:
(a) as the displacer rod initiates an induction stroke, permitting yielding between portions of the displacer and the displacer rod so that there is relative movement therebetween,
(b) whilst inducting feed fluid into the pumping chamber, simultaneously exhausting depressurized concentrate fluid from the expansion chamber,
(c) after the end of the induction stroke of the feed displacer, shifting the valve means across a closed intermediate position thereof during an interval of zero fluid transfer

from the cylinder by the displacer, and when pressure difference across the valve means is relatively low,

(d) as a displacer rod initiates a pumping stroke, permitting yielding between portions of the displacer and the displacer rod so that there is relative movement therebetween,

(e) whilst pressurizing feed fluid in the pumping chamber to force the pressurized feed fluid to the membrane means, simultaneously admitting into the expansion chamber pressurized concentrate fluid fraction from the membrane means to depressurize the concentrate fluid fraction to supplement energy supplied to the feed displacer in the pumping stroke, so that pressure differences across the displacer are relatively low,

(f) after the end of the pumping stroke of the feed displacer, shifting the valve means during an interval of zero fluid transfer in the expansion chamber and when pressure difference across the valve means is relatively low.

4,288,327

COPOLYMERS FOR THE CONTROL OF THE FORMATION AND DEPOSITION OF MATERIALS IN AQUEOUS MEDIUMS

Irene T. Godlewski, Cinnaminson, N.J.; Joseph J. Schuck, Holland, and Andrew S. Chisarik, Cornwells Heights, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 689,755, May 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 610,952, Sep. 8, 1975, abandoned. This application Jan. 19, 1979, Ser. No. 4,646

Int. Cl.³ C02F *5/10*

U.S. Cl. 210—698 **59 Claims**

1. A method of controlling the formation and deposition of materials on the structural parts of a system containing an aqueous medium, which in turn contains ions which would otherwise form and deposit as said materials, which comprises introducing into the aqueous medium an effective amount for the purpose of a polymer or the water soluble salt of said polymer, which polymer is comprised of sulfonated styrene moieties and moieties derived from maleic anhydride, the ratio of said styrene moieties to said maleic anhydride derived moieties being from about 2:1 to about 4:1.

4,288,328

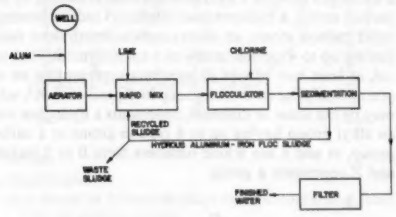
USE OF SPECIALLY PREPARED IRON FLOC TO OXIDIZE AND REMOVE IRON IN WATER TREATMENT PROCESSES

John R. Montgomery, Tuscaloosa, Ala., assignor to Iron Removal Specialists, Inc., Tuscaloosa, Ala.

Continuation-in-part of Ser. No. 45,609, Jul. 19, 1979, abandoned. This application Nov. 28, 1980, Ser. No. 211,095

Int. Cl.³ C02F *1/52, 1/76*

U.S. Cl. 210—713 **3 Claims**



1. A process for treating water containing ferrous compounds comprising the following steps:

(a) a first step of adding approximately 1 to 50 mg/l of alum to the untreated water;

(b) a second step of aerating the water by intimate contact with air to remove dissolved gases and add oxygen to the water and to oxidize said ferrous compounds into iron oxides;

(c) a further step of adding lime to the water to adjust the pH of the water to a value approximately from 7 to 9;

(d) a further step of adding to the water recycled hydrous aluminum-iron floc sludge, collected in step (h) to produce a water to sludge ratio of about 2 to 30 percent by volume, said hydrous aluminum-iron floc sludge having an iron to aluminum ratio in the range of 15.7–57.3 by weight;

(e) a further step of detention of the water for a time, after steps (a)–(d), and prior to the addition of chlorine in step (f) said detention time being effective in forming said hydrous aluminum-iron floc sludge including said iron oxides;

(f) a further step of addition of chlorine to the water to produce a final concentration of at least about 0.5 mg/l;

(g) a further step of separating the hydrous aluminum-iron floc sludge, formed in the prior steps, from the treated water; and

(h) collecting the hydrous aluminum-iron floc sludge and recycling a part thereof for use in step (d).

4,288,329

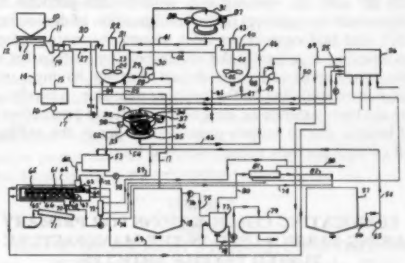
METHOD AND APPARATUS FOR CLEANING FINE WASTE MATERIAL MIXED WITH OIL AND WATER

Leonard A. Duval, 207 Harmon Rd., Aurora, Ohio 44202

Filed Nov. 9, 1979, Ser. No. 93,004

Int. Cl.³ B01D *21/02;* **B08B** *3/10*

U.S. Cl. 210—772 **2 Claims**



2. A method of cleaning fine solid waste material mixed with oil and water, comprising one intergrated system including (a) first decanting most of the water at a feed point, then (b) mixing with solvent said solids-oil-water material thoroughly in a first mixer, (c) returning excess expended solvent from said first mixer to said feed point, (d) then pumping the slurry of solids and solvents to a first dewetter-separator device, (e) transferring expended solvent from said first dewetter-separator device back to said first mixer, (f) transferring solids from said first dewetter-separator device to a second mixer, (g) thoroughly mixing with solvent these latter solids in the second mixer, (h) pumping the slurry of solids-solvent-water from said second mixer to a second dewetting-separator device, (i) transferring expended solvent from said second dewetting-separator device to said second mixer, (j) transferring solids from said second dewetting-separator device to a dewetting screen, (k) washing said solids on said dewetting screen with a small amount of clean solvent, (l) transferring expended solvent from said dewetting screen to said second mixer, (m) transferring solids from said dewetting screen to a dryer, (n) drying said solids in said dryer for use, (o) collecting all said expended solvent and passing it through a fractioning still and collecting therefrom the recovered oil, and (p) passing the solvent vapor through a condenser and to a regenerated solvent storage.

4,288,330

SUPPORT WITH ROTARY SYMMETRIC OPENINGS FOR FILTER AID, METHOD AND APPARATUS

Fritz Strub, St. Gallen, Switzerland, assignor to Filtrox Maschinenbau AG, St. Gallen, Switzerland

Continuation of Ser. No. 457,205, Apr. 2, 1974, abandoned. This application Dec. 16, 1976, Ser. No. 751,220

Claims priority, application Switzerland, Apr. 3, 1973, 4729/73

Int. Cl.³ B01D *37/02*

U.S. Cl. 210—777 **3 Claims**

1. In a process of filtering fluids utilizing as the active filtering component a layer of filter aid particles settled directly on and supported by a sheet-metal support provided with openings for passage of the filtered fluid moving through said filter aid layer, said filter aid particles being from the group comprising kieselguhr and other particles with similar irregular surfaces which promote bridging and are smaller in particle size diameter than the smallest diameter of said openings, wherein the liquid to be filtered is introduced on the side of said filter aid layer opposite said support and removed downstream of said support, the improvement of using as said support a support penetrated by a multitude of rotary symmetric openings of circular cross-section throughout their length and having a diameter of their narrowest point in the range of 50 to 250 microns, the walls of said opening making an angle of less than about 20° with the opening axis, whereby the particles form bridges over the openings in the configuration of dome-shaped arches, and said support provides around the margin of each such opening a generally flat stable bearing surface for supporting the end of said dome-shaped arch and having a width at least corresponding to the opening diameter, whereby said filter aid layer exhibits an increased stability to breakdowns of said bridges due to sudden pressure changes in the unfiltered fluid or high pressure drops over said layer.

4,288,331

LUBRICATING COMPOSITIONS FOR PRIMARY BACKING FABRICS USED IN THE MANUFACTURE OF TUFTED TEXTILE ARTICLES

John D. Shepley, and Herman M. Muijs, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 13, 1979, Ser. No. 48,289

Int. Cl.³ D06M *13/18*; C10M *1/20*

U.S. Cl. 252—8.9 **8 Claims**

1. A lubricating composition comprising a major amount of a polyalkoxylate lubricating oil and 0.001 to 10% by weight, based on the polyalkoxylate lubricating oil, of a saturated or unsaturated aliphatic carboxylic acid of from 10 to 20 carbon atoms.

4,288,332

METHODS AND COMPOSITIONS FOR TREATING SUBTERRANEAN FORMATIONS

Bobby E. Hall, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 770,881, Feb. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 533,375, Dec. 16, 1974, abandoned. This application Aug. 27, 1979, Ser. No. 70,286

Int. Cl.³ E21B *43/27*

U.S. Cl. 252—8.55 C **17 Claims**

1. A composition for treating a subterranean formation comprising:

an aqueous acid solution capable of dissolving mineral constituents contained in said formation;

at least one additive having surface active properties present in said aqueous treating solution for imparting desired treating properties to said solution and to said formation to be treated; and

a chemical having the property of reducing the adsorption of said additive on material surfaces present in said formation, said chemical being present in said composition in the range of from about 1% to about 90% by volume of said composition and having the general formula:

$$C_nH_{2n+1}(OC_2H_4)_xR$$

wherein:

n has a value in the range of from about 4 to about 12;

x has a value in the range of from about 1 to about 10; and

R is a radical selected from the group consisting of $-OCH_3$, $-OSO_3^-M^+$ and $-NH_2$, wherein M^+ is one of H^+, NH_4^+, Na^+, K^+, Ca^{++} and Mg^{++}.

4,288,333

DISSOLVING BARIUM SULFATE SCALE WITH AQUEOUS SOLUTIONS OF SALTS OF PHOSPHOMETHYL AND AMINO-SUBSTITUTED MACROCYCLIC POLYETHERS

Arie van Zon; Feike de Jong, and Gerridina J. Torny-Schutte, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 5, 1979, Ser. No. 91,009

Claims priority, application United Kingdom, Jun. 29, 1979, 22689/79

Int. Cl.³ C02F *5/14*; E21B *43/25*

U.S. Cl. 252—8.55 B **5 Claims**

1. A process for dissolving solid barium sulfate in or around a well in a location into which fluid can be flowed, which process comprises:

flowing into said well and into contact with the barium sulfate an aqueous solution consisting essentially of water, a phosphomethyl and amino-substituted macrocyclic polyether and sufficient dissolved alkaline, inorganic, alkali metal or ammonium compound to provide a pH of at least about 8; and,

using as said polyether a compound of the formula

wherein each A^1, which may be the same or different, represents a hydrocarbon radical of up to 12 carbon atoms and each D, which may be the same or different, represents an oxygen or sulphur atom or a hydrocarbon radical having up to 6 carbon atoms or a group N-R, representing a hydrogen atom or a hydrocarbon radical having up to 12 carbon atoms, a hydrocarbon sulphonyl radical having up to 12 carbon atoms, an alkoxycarbonylmethylene radical having up to 4 carbon atoms or a carboxymethylene radical, at least two of said D members representing an oxygen or a sulphur atom or a group N-R, and each R^1, which may be the same or different, represents a hydrogen atom, an alkyl group having up to 6 carbon atoms or a carboxy group, m and n are whole numbers from 0 to 5 inclusive and Z represents a group

wherein y is 0 or 1 and R^2 and R^3, which may be the same or different, represent a hydrogen atom or an alkyl group or a lithium, sodium, potassium or ammonium ion.

4,288,334

PROCESS FOR SECONDARY RECOVERY OF HYDROCARBONS

David R. McCoy, and Carter G. Naylor, both of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Jan. 17, 1980, Ser. No. 112,690
Int. Cl.[3] E21B *43/22*
U.S. Cl. 252—8.55 D 11 Claims

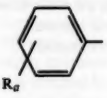
1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(A) injecting into the formation via an injection well a drive fluid comprising water having dissolved therein:

(a) from 0.05 to about 6.0 weight percent of a nonionic surfactant of the formula:

$$RO(CH_2CH(OH)CH_2O)_m(CH_2CH_2O)_nH,$$

wherein R is selected from the group consisting of alkyl of from 8 to about 20 carbon atoms and



wherein R_a is branched or linear alkyl of from 6 to about 18 carbon atoms, wherein m is an integer of from 1 to about 20 and n is an integer of from 2 to about 20, and

(b) about 0.03 to about 5 weight percent of a surfactant selected from the group consisting of an anionic sulfonate and an anionic sulfate surfactant,

(B) forcing the said fluid through the formation, and

(C) recovering hydrocarbons through the production well.

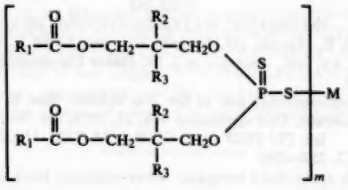
4,288,335

NOVEL METALLIC DITHIOPHOSPHATES AND THEIR USE AS ADDITIVES FOR LUBRICATING OILS

Georges Rivier, Bron, France, assignor to Orogil, Courbevoie, France

Filed Mar. 4, 1980, Ser. No. 127,049
Claims priority, application France, Mar. 9, 1979, 79 06058
Int. Cl.[3] C10M *1/48;* C07F *3/06*
U.S. Cl. 252—32.7 E 37 Claims

1. A metallic dithiophosphate having the formula:



in which:

R_1 represents:

(a) a linear or branched alkyl radical containing from about 1 to 24 carbon atoms;

(b) a linear or branched alkenyl radical containing from about 2 to 24 carbon atoms;

(c) a saturated or unsaturated cycloaliphatic or polycycloaliphatic radical containing from about 3 to 20 carbon atoms;

(d) an aryl radical containing from 6 to 14 carbon atoms;

(e) a heterocyclic radical containing one or more heteroelements selected from among nitrogen, sulfur and oxygen;

R_2 and R_3 are alkyl radicals containing from about 1 to 12 carbon atoms;

m represents the valence of the metal M;

M represents a metal of groups IIB, IIIB, IVB, or VIII of the Periodic System of the Elements.

4,288,336

PROCESS FOR PREPARING OVERBASED ALKALINE EARTH METAL SULFONATES

Garth M. Stanton, San Anselmo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 28, 1980, Ser. No. 182,158
Int. Cl.[3] C10M *1/40, 1/22, 3/16*
U.S. Cl. 252—33 8 Claims

1. In a process for the preparation of an overbased alkaline earth metal sulfonate in which a mixture of a hydrocarbyl sulfonic acid or neutral sulfonate in an organic solvent comprising a mineral oil, is overbased with an akaline earth metal base, the improvement comprising carrying out said overbasing in the presence of a solution of a sugar.

4,288,337

LIGHTWEIGHT MATERIALS HAVING A HIGH DIELECTRIC CONSTANT AND THEIR METHOD OF MANUFACTURE

Hiroshi Ota, Tokyo; Noboru Sakuma, Kamakura; Takeki Takarabe, and Isao Takiguchi, both of Tokyo, all of Japan, assignors to Tokyo Keiki Company Limited, Tokyo, Japan

Filed Aug. 31, 1979, Ser. No. 71,690
Claims priority, application Japan, May 2, 1977, 52-50958
Int. Cl.[3] H01B *3/02*
U.S. Cl. 252—512 12 Claims

1. A mixed dielectric obtained by mixing the expanded particles selected from the group consisting of expanded polystyrols, expanded polyethylenes, expanded polyurethanes, glass balloons and silica balloons, with metal-coated particles consisting of said expanded particles whose surfaces have been coated with a thin film selected from the group of chromium, aluminum, copper, nickel, gold, silver and magnesium in proper proportions to obtain a desired dielectric constant and then forming the same to a desired shape by the use of binder.

4,288,338

STATIC SOLAR HEAT STORAGE COMPOSITION

Hugh J. Phillips, 2510 N. 156th St., Omaha, Nebr. 68116

Continuation-in-part of Ser. No. 39,312, May 16, 1979, abandoned. This application Mar. 17, 1980, Ser. No. 131,067
Int. Cl.[3] C09K *3/00*
U.S. Cl. 252—70 10 Claims

1. A composition for the storage of heat energy utilizing the heat of fusion of the composition, said composition comprising a salt-hydrate having a heat of fusion of more than about 50 BTU per pound, a nucleating agent and a porous solid selected from the group consisting of calcium sulfate hemihydrate and soluble calcium sulfate anhydride at a level from about 15 to about 75 percent by weight based on the weight of the salt portion of said salt-hydrate.

4,288,339

SPRAY CLEANER COMPOSITION FOR THE SPOT TREATMENT OF TEXTILES BEFORE WASHING

Heinz-Manfred Wilsberg, Monheim-Baumberg, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Sep. 15, 1980, Ser. No. 187,521
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1979, 2939810
Int. Cl.[3] C11D *1/68, 1/825, 3/44, 17/08*
U.S. Cl. 252—90 7 Claims

1. A pressurized aerosol spray cleaner, for the spot treatment of textiles before washing, comprising a pressurized container

containing from 2 to 3.6 parts by weight of carbon dioxide as propellant and from 96.4 to 98 parts by weight of a spray cleaner composition consisting essentially of, without propellant,

(a) from 6% to 16% by weight of ethoxylated C_6–C_{10}-alcohols selected from the group consisting of alkanols and alkenols, having an average of from 4 to 8 ethylene glycol ether groups, wherein the content of saturated C_8-alkanol is at least 50% by weight,

(b) from 6% to 10% by weight of ethoxylated C_{12}–C_{18}-alcohols selected from the group consisting of alkanols and alkenols, having an average of from 2 to 4 ethylene glycol ether groups, wherein the content of C_{16}–C_{18}-alkanols is not more than 50% by weight,

(c) from 6% to 10% by weight of ethoxylated C_{16}–C_{18}-alcohols selected from the group consisting of alkanols and alkenols, having an average of from 10 to 15 ethylene glycol ether groups,

(d) from 40% to 45% by weight of aliphatic hydrocarbons having a boiling range of from 205° to 245° C., and

(e) from 10% to 35% by weight of at least one chlorohydrocarbon selected from the group consisting of methylene chloride, ethylene chloride, 1,1,1-trichloroethane and perchloroethane;

with the proviso that components (a), (b) and (c) amount to from 20% to 35% by weight of said composition and components (d) and (e) amount to from 65% to 80% by weight of said composition.

7. A method of spot treatment of spot-soiled textiles consisting essentially of spraying said spots of soil with an effective amount of the spray cleaner of claim 1, washing said spot-soiled textiles in water with a conventional detergent composition, rinsing said washed textiles, and recovering washed textiles free of spots of soil.

4,288,340

GRANULATED COMPOSITION COMPRISING A POLYMER PHOSPHATE AND AN ALKALI METAL ALUMINUM SILICATE, PROCESS OF MAKING AND METHOD OF USING SAME

Juergen Dankworth, Bensheim; Helmut Hartenstein, Ruelzheim, and Ludwig Hertling, Biblis, all of Fed. Rep. of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen am Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 892,209, Mar. 31, 1978, Pat. No. 4,171,277. This application Oct. 2, 1978, Ser. No. 947,643

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2744773

The portion of the term of this patent subsequent to Oct. 16, 1996, has been disclaimed.

Int. Cl.[3] **C01B** *33/28;* **C02B** *1/42;* **C11D** *3/12, 11/00*

U.S. Cl. 252—99 **13 Claims**

1. A process of producing an agglomerated composition comprising granulating a pulverulent mixture comprising an ion-exchanging alkali metal aluminum silicate and a polymer phosphate comprising from 5 to 100 weight percent highly condensed polymer phosphates of the formula:

$$Me^{I}{}_{(n+2)}P_nO_{(3n+1)}$$

wherein Me represents an alkali metal and n is an integer from 4 to about 50 and from 95 to 0 weight percent alkali tripolyphosphate, by spraying said mixture with water in a spray mixer or a rotary tubular mixer, the weight ratio of polymer phosphate to alkali metal aluminum silicate in said mixture being from 1:20 to 20:1.

2. The process of claim 1, wherein said pulverulent mixture further comprises an effective amount of at least one of the following additives: anionic surfactants, active oxygen-containing compounds, optical brighteners, alkali metal metasilicates, alkali metal disilicates, sodium carbonates, active chlorine-containing organic compounds, foam-inhibiting agents, corrosion-inhibiting agents and mixtures thereof.

4,288,341

DETERGENT PRODUCT CONTAINING DEODORANT COMPOSITIONS

David C. Hooper, Ashford; George A. Johnson, and Donald Peter, both of Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 15, 1978, Ser. No. 933,943

Claims priority, application United Kingdom, Mar. 20, 1978, 10969/78; May 16, 1978, 19841/78

Int. Cl.[3] **C11D** *9/44, 9/50*

U.S. Cl. 252—107 **16 Claims**

1. A deodorant toilet soap bar comprising:

(i) from 0.5 to 99.9% by weight of a soap mixture;

(ii) from 0 to 15% by weight of C_6 to C_{18} straight chain fatty acids; and

(iii) from 0.1 to 10% by weight of a deodorant composition comprising from 45 to 100% by weight of deodorant active components, said components having a lipoxidase-inhibiting capacity of at least 50% or a Raoult variance ratio of at least 1.1, said components being classified into six classes consisting of:

Class 1: phenolic substances

Class 2: essential oils, extracts, resins and synthetic oils

Class 3: aldehydes and ketones

Class 4: polycyclic compounds

Class 5: esters

Class 6: alcohols

provided that where a component can be classified into more than one class, it is placed in the lower or lowest numbered class;

said components being so selected that

(a) the deodorant composition contains at least five components of which at least one must be selected from each of Class 1,Class 2 and Class 4;

(b) the deodorant composition contains components from at least 4 of the 6 classes, and

(c) any component present in the deodorant composition at a concentration of less than 0.5% by weight of said composition is eliminated from the requirements of (a) and (b), said deodorant composition having a deodorant value of from 0.50 to 3.5 as measured by the Deodorant Value Test.

4,288,342

INORGANIC WATER-SOFTENING BEAD

Joseph E. Wagner, III, Newark, Del., and Lloyd E. Williams, Bel Air, Md., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 883,006, Mar. 3, 1978, abandoned. This application Jun. 21, 1979, Ser. No. 50,938

Int. Cl.[3] **C02F** *1/42;* **C11D** *3/12, 7/20, 11/02*

U.S. Cl. 252—140 **8 Claims**

1. A spray dried inorganic water-softening bead consisting of:

(a) at least 66% by weight of sodium aluminosilicate on an anhydrous basis having a silica to aluminum oxide ratio of between 2:1 and 4:1 and a sodium oxide to aluminum oxide ratio of between 0.8:1 and 1.2:1;

(b) from 1 to 20% by weight of sodium silicate with a silica to sodium oxide ratio of between 1:1 and 3.3:1;

(c) from 1 to 20% by weight of a solubilizing agent selected from the group consisting of soluble sodium phosphates, sodium carbonates, sodium bicarbonates, sodium tetraborates and sodium sulfate; and

(d) the remainder being water.

4,288,343

METHOD FOR INCREASING SHELF-LIFE OF A SERUM BILIRUBIN REFERENCE COMPOSITION AND COMPOSITION PRODUCED THEREBY

Allan L. Louderback, Temple City, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 925,484, Jul. 17, 1978, Pat. No. 4,201,694. This application Mar. 22, 1979, Ser. No. 22,567

The portion of the term of this patent subsequent to May 6, 1997, has been disclaimed.

Int. Cl.[3] **G01N** *33/48;* **C09K** *3/00*

U.S. Cl. 252—408 **14 Claims**

1. An improved blood serum reference composition of the type comprising blood serum having a bilirubin constituent of known value, characterized in that said composition possesses a pH of from about 8.2 to about 9.2 and further comprises:

(a) a sulfhydryl compound in an amount sufficient to further enhance the stability of bilirubin and

(b) a chelating agent in an amount sufficient to bind the metals present in said blood serum.

7. An improved bilirubin reference composition comprising in its non-biological component from about 60 to about 80 weight percent water, from about 20 to about 40 weight percent of at least one alkylene polyol having from 2 to 5 carbon atoms, the remainder being bilirubin and, optionally, other natural biological materials selected from a group consisting of blood serum, enzymes, metabolites, electrolytes, and hormones, characterized in that said composition possesses a pH of from about 8.2 to about 9.2 and further comprises:

(a) a sulfhydryl compound in an amount sufficient to further enhance the stability of bilirubin and

(b) a chelating agent in an amount sufficient to bind the metals present in said blood serum.

4,288,344

STABLE DIAZONIUM SALT GENERATOR FOR IMPROVED MARIJUANA ANALYSIS

Andre Reiss, 147-47 Village Rd., Jamaica, N.Y. 11435

Continuation-in-part of Ser. No. 744,288, Nov. 22, 1976, abandoned, and Ser. No. 903,750, May 8, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 55,616

Int. Cl.[3] **G01N** *21/06, 31/22;* **C09K** *3/00*

U.S. Cl. 252—408 **2 Claims**

1. A Composition of Matter utilized as a Diazonium Salt Generator comprising Methyl Cellosolve, saturated with Zirconium Oxychloride and Sodium Cobaltinitrite.

2. A Composition of Matter used as a reagent in a pre-packaged test kit for Marijuana detection comprising Fast Blue BB Base dissolved in a diazotizing solution of Methyl Cellosolve saturated with Zirconium Oxychloride and Sodium Cobaltinitrite; contact of said reagent with Marijuana plant Phenols producing a characteristic reddish dye color when developed by an equal volume of a second aqueous alkaline solution.

4,288,345

PLATINUM COMPLEX

Bruce A. Ashby, Schenectady, and Frank J. Modic, Scotia, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

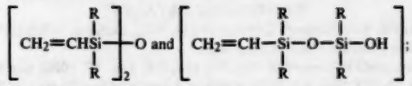
Filed Feb. 6, 1980, Ser. No. 119,014

Int. Cl.[3] **C07F** *15/00;* **B01J** *31/12*

U.S. Cl. 252—431 R **10 Claims**

1. A platinum-siloxane complex catalyst, substantially free of inhibitory impurities and detectable inorganic halogen, and consisting essentially of

(i) one gram-atom of chemically combined platinum and one mole each of an organosiloxane of the formula



(ii) one gram-atom of chemically combined platinum and two moles of an organosiloxane of the formula

(iii) a combination of (i) and (ii); wherein R is free of aliphatic unsaturation and is selected from alkyl radicals, cycloalkyl radicals and phenyl radicals.

4,288,346

CATALYST FOR CATALYTIC HEAT EXCHANGE

James B. Hunter, Newtown Square, and George McGuire, West Chester, both of Pa., assignors to Johnson Matthey Inc., Malvern, Pa.

Continuation of Ser. No. 925,862, Jul. 18, 1978, Pat. No. 4,214,867. This application Feb. 7, 1980, Ser. No. 119,315

Int. Cl.[3] **B01J** *21/04, 23/64, 27/18, 35/04*

U.S. Cl. 252—437 **4 Claims**

1. A catalyst consisting essentially of a heat conductive metal screen membrane having two sides, the membrane being coated on both sides with alumina cement so as to fill openings in the screen and make the screen gas impervious, the alumina cement coating on at least one side having a catalytically active material thereon comprising one or more platinum group metals and the alumina cement coating being derived from an aqueous dispersion of aluminum metal powder, chromium salt and aluminum phosphate binder.

4,288,347

NOVEL CATALYST FOR DEALKYLATING ALKYL BENZENES AND FRACTIONS OF AROMATIZED BENZINES BY CONVERSION WITH STEAM

Georgy L. Rabinovich, ulitsa Antonova-Ovseenko, 19, korpus 2, kv. 104; Gdal N. Maslyansky, Moskovsky prospekt, 189, kv. 64; Ljubov M. Birjukova, Zhdanovskaya naberezhnaya, 9, kv. 2, all of Leningrad; Emmanuil A. Levitsky, ulitsa Akademicheskaya, 6, kv. 42, Novosibirsk; Kira L. Volkova, ulitsa Antonova-Ovseenko, 19, korpus 2, kv. 4, Leningrad; Zoya P. Lukina, Manezhny pereulok, 2, kv. 2, Leningrad, and Viktor N. Mozhaiko, ulitsa Nevskaya, 3, kv. 3, Otradnoe Leningradskoi oblasti, all of U.S.S.R.

Filed Jun. 18, 1979, Ser. No. 49,722

Int. Cl.[3] **B01J** *27/02, 23/14, 23/16, 23/62*

U.S. Cl. 252—439 **12 Claims**

1. A catalyst for dealkylating alkyl benzenes and fractions of aromatized benzines by means of conversion with steam, consisting essentially of elements selected from the group consisting of rhodium or rhodium mixed with another metal from Group VIII of the Periodic Table in an amount of 0.01 to 5 wt.%; and at least one element selected from the group consisting of sulfur, selenium and lead in an amount of 0.003 to 3 wt.%; and at least one element selected from the group consisting of chromium, copper, and vanadium in an amount of 0.01 to 5 wt.%; and a carrier.

4,288,348

SEPARATELY SUPPORTED POLYMETALLIC REFORMING CATALYST

Hans J. Schoennagel, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 112,756, Jan. 17, 1980, and Ser. No. 76,047, Sep. 17, 1979, which is a continuation-in-part of Ser. No. 934,143, Aug. 16, 1978, abandoned, said Ser. No. 112,756, is a continuation of Ser. No. 934,143, , abandoned. This application Feb. 13, 1980, Ser. No. 120,956

Int. Cl.[3] B01J 27/08, 27/10, 23/64, 21/04

U.S. Cl. 252—441 11 Claims

1. A catalyst composition made up of a mixture of two components one component comprising a minor proportion of platinum and rhenium on a support and the second component comprising a minor proportion of iridium on a separate support.

4,288,349

PERFUME COMPOSITIONS CONTAINING 3,3-DIMETHYLBICYCLO-[2,2,1]-HEPTANE-2-CARBOXYLIC ACID AS A PERFUME

Harmannus Boelens, Huizen, and Roelof Ter Heide, Bussum, both of Netherlands, assignors to Naarden International N.V., Naarden-Bussum, Netherlands

Filed Nov. 5, 1979, Ser. No. 91,158

Claims priority, application Netherlands, Nov. 3, 1978, 7810966

Int. Cl.[3] A23L 1/226

U.S. Cl. 252—522 R 6 Claims

1. A perfume composition containing 3,3,-dimethylbicyclo-[2,2,1]-heptane-2-carboxylic acid as a fragrance to impart an acidic and somewhat resinous odor tending to cistus and olibanum.

4,288,350

PERFUME COMPOSITIONS CONTAINING DIALKYL DELTA-LACTONES

Kees N. Nieuwland, Amersfoort, and Dirk K. Kettenes, Putten, both of Netherlands, assignors to Polak's Frutal Works B.V., Amersfoort, Netherlands

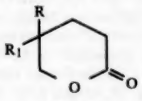
Continuation of Ser. No. 858,502, Dec. 7, 1977, abandoned. This application Mar. 26, 1980, Ser. No. 134,010

Claims priority, application United Kingdom, Dec. 23, 1976, 53707/76

Int. Cl.[3] A61K 7/46; C11B 9/00

U.S. Cl. 252—522 R 7 Claims

1. A fragrance composition comprising, in combination with other olfactorily active materials, an odor-modifying amount of a substitutedδ-valerolactone having the structural formula



where R and R_1 are the same or different alkyl or alkenyl groups.

4,288,351

WATER REDUCIBLE ALKYD RESIN COATING COMPOSITION

Lester I. Miller, Troy, Mich., and Thomas J. Smearing, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 20,984, Mar. 16, 1979, abandoned. This application May 27, 1980, Ser. No. 153,205

Int. Cl.[3] C09D 3/52, 3/66, 5/02

U.S. Cl. 260—21 20 Claims

1. A coating composition comprising about 40–90% by weight of a film forming binder and about 10–60% by weight of a water soluble organic solvent and pigments in a pigment to binder weight ratio of about 1:100 to 300:100; wherein the binder consists essentially of about

(1) 60–90% by weight, based on the weight of the binder, of an alkyd resin consisting essentially of the esterification product of soya oil fatty acid, isophthalic acid, trimellitic acid or its anhydride and trimethylol propane having an acid number of about 20–100 and a weight average molecular weight of about 800–15,000 determined by gel permeation chromatography;

(2) 0.5–15% by weight, based on the weight of the binder, of an alkylated melamine formaldehyde resin;

(3) 1–20% by weight, based on the weight of the binder, of an acrylic dispersing resin comprising styrene, an alkyl methacrylate, an alkyl acrylate and an ethylenically unsaturated carboxylic acid; and

(4) 0.5–5% by weight, based on the weight of the binder, of an organo metallic drier.

4,288,352

ELECTRICALLY CONDUCTIVE POLYMERIC COMPOSITIONS

Robert A. Weiss, Summit, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 26, 1979, Ser. No. 23,632

Int. Cl.[3] C08L 91/00

U.S. Cl. 260—23.5 A 17 Claims

1. A polymeric composition produced by the high shear intensity mixing of a mixture of:

(a) a neutralized sulfonated polymer having about 5 to about 100 meq. neutralized sulfonate groups per 100 grams of said neutralized sulfonate polymer, said neutralized sulfonated polymer being formed from a unsulfonated polymer having a Mooney viscosity (M.L. 1+8, 212° F.) of about 10 to about 60;

(b) about 10 to 20 parts by weight of discontinuous and uniaxially oriented carbon or graphite fibers per 100 parts by weight of said neutralized sulfonated polymer, said fibers having a length of about 0.125 inches; and

(c) at least about 3 parts by weight of a preferential ionic plasticizer based on 100 parts by weight of said neutralized polymer.

4,288,353

CARBON BEARING CONTACT PASTE

Wolf-Dietrich Eckel, Frankfurt, and Eckhard Schulz, Bad Homburg, both of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland and Sigri Elektrographit GmbH, Meitingen, Fed. Rep. of Germany

Filed Oct. 8, 1980, Ser. No. 194,965

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1979, 2942469

Int. Cl.[3] C08L 95/00; C09J 3/30

U.S. Cl. 260—28 R 10 Claims

1. Contact paste, which can be cold worked and contains carbonizable binding agents and powdered solids, which comprises as binder a mixture of epoxy resin and tar, as solids a mixture of grahite and metal powders, and an acid-free hardener.

4,288,354

CONCRETE JOINT SEALANT

Kiyozo Shiomoto, Hiroshima, Japan, assignor to AOI Chemical Inc., Shiroshima, Japan

Continuation-in-part of Ser. No. 16,179, Feb. 28, 1979. This application Apr. 17, 1980, Ser. No. 140,460

Claims priority, application Japan, Aug. 30, 1978, 53-105904; United Kingdom, Mar. 2, 1979, 07412/79; Taiwan, Mar. 24, 1979, 6811135

Int. Cl.³ C08L *91/00*

U.S. Cl. 260—28.5 AS 7 Claims

1. A concrete joint sealant composed of 10–40 weight % coal tar mainly consisting of a distillate boiling at up to 350° C.; 2–25 weight % vinyl chloride resin; 5–15 weight % coal pitch; and 20–40 weight % of a mixture of dioctyl phthalate and dioctyl adipate as plasticizers.

4,288,355

SURGICAL CEMENT COMPOSITION

Harvey L. Anderson, Dellwood, and Ronald M. Randklev, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 22, 1978, Ser. No. 908,576

Int. Cl.³ C08K *3/22*

U.S. Cl. 260—29.6 M 10 Claims

1. A process for the preparation of a surgical cement which comprises forming a mixture of an aqueous suspension of metal oxide powder, said powder being about 30 to 60 percent by volume of said suspension, and an aqueous solution of polycarboxylic acid, said acid being about 55 to about 80 percent by weight of said solution, and wherein the weight ratio of said suspension of metal oxide powder to said aqueous polycarboxylic acid is 0.5/1 to 8/1.

4,288,356

POLYSILOXANE EMULSION ELASTOMERS REINFORCED WITH EMULSIFIED ORGANO-SILICONE COPOLYMERS

David J. Huebner, and Donald R. Weyenberg, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 30, 1980, Ser. No. 192,397

Int. Cl.³ C08L *83/06*

U.S. Cl. 260—29.6 NR 12 Claims

1. A method of blending aqueous emulsions to provide an elastomeric product upon devolatization comprising:

(I) mixing

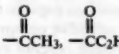
(A) an aqueous emulsion of an anionic emulsion polymerized hydroxyl endblocked polydiorganosiloxane, said hydroxyl endblocked polydiorganosiloxane having a weight average molecular weight of at least 5000, the organo groups being selected from the group consisting of monovalent hydrocarbon radicals containing less than seven carbon atoms per radical and 2-(perfluoroalkyl)ethyl radicals containing less than seven carbon atoms per radical, and

(B) an aqueous emulsion of an emulsion polymerized copolymer consisting essentially of free radical polymerized monomers selected from at least one unsaturated organic monomer and at least one unsaturated organosilicon monomer selected from the group consisting any unsaturated silane, siloxane, or silazane that will both copolymerize with the unsaturated organic monomer or mixture of unsaturated organic monomers used and will form ≡SiOH under the conditions of the emulsion polymerization method used to produce the copolymer, said copolymer being produced from 1 to 7 weight percent unsaturated organosilicon monomer and 93 to 99 weight percent unsaturated organic monomer, to form a mixture of emulsions,

(II) adjusting the mixture to a pH of 7 or greater,

(III) adding with agitation an amount of aqueous emulsion, (C), of an alkyl tin salt to provide from 0.1 to 2 parts by weight of alkyl tin salt for each 100 parts by weight of polydiorganosiloxane, and thereafter

(IV) adding with agitation an amount of silane cross-linking agent, (D), to obtain crosslinking, said silane crosslinking agent having the general formula $A_mSi(OR)_{4-m}$ wherein A is a member selected from the group consisting of a hydrogen atom, monovalent hydrocarbon radicals containing 1 to 6 inclusive carbon atoms and monovalent halohydrocarbon radicals containing 1 to 6 inclusive carbon atoms, R is a member selected from the group consisting of a hydrogen atom, an alkyl group containing 1 to 4 inclusive carbon atoms,



$-CH_2CH_2OH$, $-CH_2CH_2OCH_3$, and $-CH_2CH_2OC_2H_5$ group and m is 0 or 1, there being for each 100 parts by weight of polydiorganosiloxane in (A) sufficient (B) to provide from 5 to 60 parts by weight of emulsion polymerized copolymer.

4,288,357

COATING COMPOSITION AND METHOD FOR THE IMPROVEMENT OF SURFACE HARDNESS OF ARTICLE BY THE USE THEREOF

Hiroyuki Kanazawa, and Mikio Futagami, both of Niihama, Japan, assignors to Sumitomo Chemical Co. Ltd. and Nippon Sheet Glass, both of Osaka, Japan

Division of Ser. No. 902,736, May 3, 1978, Pat. No. 4,190,699. This application Aug. 31, 1979, Ser. No. 71,585

Claims priority, application Japan, May 10, 1977, 52-53946

Int. Cl.³ C08K *5/54*

U.S. Cl. 260—31.2 N 6 Claims

1. A coating composition consisting essentially of:

(A) 100 parts by weight of partially hydrolyzed silicon compounds consisting essentially of co-partial hydrolyzates of a tetraalkoxysilane of the formula $(Si(OR^1)_4$ wherein R^1 is an alkyl having 1 to 4 carbon atoms and an organic silicon compound of the formula: $R_n^2Si(OR^3)_{4-n}$ wherein n is an integer of from 1 to 3, R^2 is a hydrocarbon group having 1 to 6 carbon atoms and R^3 is an alkyl having 1 to 4 carbon atoms and/or a mixture of partial hydrolyzates of each tetraalkoxysilane and organic silicon compound, said partially hydrolyzed silicon compounds containing said partially hydrolyzed tetraalkoxysilane, calculated as SiO_2, and said organic partially hydrolyzed silicon compound, calculated as $R_n^2SiO_m$ wherein $m=(4-n)/2$, in the ratio of 5/95 to 95/5 by weight, and the weight (100 parts by weight) of said partially hydrolyzed silicon compounds being also calculated as SiO_2 for said partially hydrolyzed tetraalkoxysilane and as $R_n^2SiO_m$ for said partially hydrolyzed organic silicon compound,

(B) 10 to 400 parts by weight of a monomer or oligomer having two or more hydroxy groups, and

(C) 0 to 300 parts by weight of an etherified methylolmelamine, wherein said etherified methylolmelamine is contained in an amount of 0.5 to 1.5 gram equivalent per 1 gram equivalent of the monomer or oligomer, said composition being dissolved in a solvent.

4,288,358

BLENDS OF PROPYLENE/1-BUTENE OR 1-PENTENE/HIGHER α-OLEFIN COPOLYMERS, COMPATIBLE TACKIFYING RESINS AND PLASTICIZING OILS USEFUL AS HOT-MELT, PRESSURE-SENSITIVE ADHESIVES

Jimmy R. Trotter; Richard L. McConnell, and Frederick B. Joyner, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1979, Ser. No. 71,419

The portion of the term of this patent subsequent to Sep. 25, 1996, has been disclaimed.

Int. Cl.³ C08K *5/10*; C08L *23/12*

U.S. Cl. 260—31.8 M **16 Claims**

1. An adhesive composition capable of being used as a hot-melt, pressure-sensitive adhesive comprising a blend of

(1) about 98 to 25 weight percent of an olefin copolymer containing 10–65 mole % propylene, 15–75 mole % of either 1-butene or 1-pentene and 3 to 14 mole percent of at least one higher linear alpha-olefin of 6 to 10 carbon atoms, said copolymer having a melt viscosity of 10,000 to 1,000,000 centipoise at 190° C.,

(2) 1 to 60 weight percent of at least one compatible tackifying resin, and

(3) 1 to 25 weight percent plasticizing oil.

4,288,359

EPOXY IMIDE COMPOSITIONS

William F. Graham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

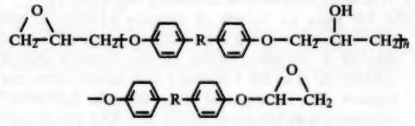
Continuation-in-part of Ser. No. 848,638, Nov. 4, 1977, abandoned. This application Apr. 5, 1979, Ser. No. 27,444

Int. Cl.³ C08L *63/00*

U.S. Cl. 260—32.8 EP **11 Claims**

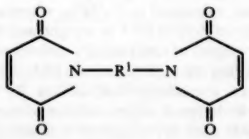
1. A composition comprising 20–80% by weight of a reaction product and 20–80% of a nonamide solvent for the reaction product having a dispersion solubility parameter of 7.2–10.5, a polar solubility parameter of 3–9.5 and a hydrogen bonding solubility parameter of 0–5.5; wherein the reaction product consists essentially of

(a) an epoxy resin of the formula



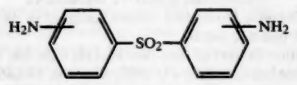
wherein R is an alkylene group of 1–4 carbon atoms, n is a positive integer; and the resin having an epoxide equivalent of about 150–1000; and

(b) a bismaleimide of the formula



where R^1 is an aromatic, aliphatic or cycloaliphatic group and wherein (a) and (b) are reacted at 115°–135° C. for about 0.5–2 hours and subsequently contacting the product of (a) and (b) with

(c) a diamine of the formula



wherein the molar ratio of bismaleimide to diamine is about 0.6 to 0.8.

4,288,360

FLAME RESISTANT SILICONE RUBBER COMPOSITIONS AND METHODS

William J. Bobear, Latham, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,795

Int. Cl.³ C08L *83/04*

U.S. Cl. 260—37 SB **16 Claims**

1. A composition curable to a silicone rubber exhibiting improved flame retardancy and tear strength comprising:

(A) 100 parts by weight of a base compound comprising a polydiorganosiloxane gum or blend of polydiorganosiloxane gums having a viscosity of 1,000,000 to 200,000,000 centipoise at 25° C., and having an average unit formula of $R_aSIO_{(4-a)/2}$, wherein R is a monovalent substituted or unsubstituted hydrocarbon radical selected from the class consisting of methyl, vinyl and phenyl radicals, a is approximately, 1.98 to 2.05, and wherein approximately, 0 to 5.0 mole percent of the total organic groups are vinyl radicals; (B) 0.01 to 250 ppm platinum; (C) 1.0 to 20 parts by weight hydrated alumina, and (D) 0.001 to 2.0 parts by weight magnesium oxide.

4,288,361

SUBSTITUTED OXAZOLINES AS STABILIZERS

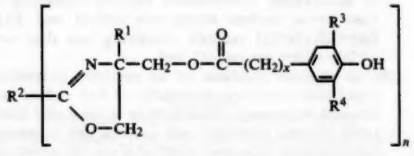
Mary J. Zestermann, Cincinnati, and John F. Hussar, Loveland, both of Ohio, assignors to Carstab Corporation, Reading, Ohio

Division of Ser. No. 952,492, Oct. 18, 1978, Pat. No. 4,205,176. This application Nov. 9, 1979, Ser. No. 93,030

Int. Cl.³ C08K *5/35*

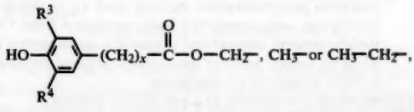
U.S. Cl. 260—45.8 NZ **15 Claims**

1. A stabilized composition resistant to oxidative degradation comprising (a) an organic substance normally susceptible to oxidative deterioration and (b) a stabilizingly effective amount of an oxazoline compound which has the following formula:

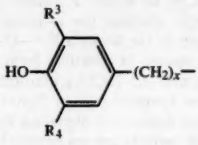


wherein

R^1 is



R^2 is, when n is 1,



or a monovalent hydrocarbyl group having from 1 to 23 carbon atoms,

R^2 is, when n is 2, an alkylene group having from 1 to 8 carbon atoms,

R^3 and R^4 are the same or different monovalent hydrocarbyl groups having from 1 to 8 carbon atoms,

n is 1 or 2 and

x is an integer of from 1 to 4.

4,288,362

MONOAZO PIGMENTS CONTAINING A QUINAZO LINONYLACETOACETANILIDE COUPLING COMPONENT

Meinhard Rolf; Rütger Neeff, and Walter Müller, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

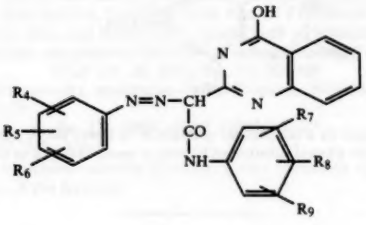
Filed May 29, 1979, Ser. No. 43,494

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2830555

Int. Cl.³ C09B *29/01, 29/32;* **D06P** *1/642, 5/06*

U.S. Cl. 260—154 **4 Claims**

1. An azo colorant of the formula



wherein

R_4 represents hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4 alkoxy, nitro, cyano, carboxyl, C_1–C_4-alkylsulphonyl, trifluoromethyl, C_1–C_4-alkylcarbonylamino, benzoylamino which is unsubstituted or substituted by C_1–C_4 alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine or nitro, C_1–C_4-alkoxycarbonyl, carbamoyl or sulphamoyl which are unsubstituted or monosubstituted or disubstituted by C_1–C_4-alkyl, phenyl or benzyl, said phenyl and benzyl being unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine and nitro, C_1–C_4-alkylsulphonylamino, and phenylsulphonylamino which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine or nitro,

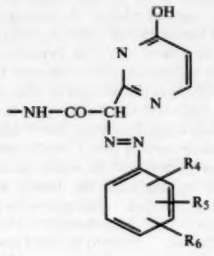
R_5 represents hydrogen, halogen, C_1–C_4-alkyl, cyano, C_1–C_4-alkoxy, nitro or trifluoromethyl,

R_6 represents hydrogen, chlorine, C_1–C_4-alkyl or C_1–C_4-alkoxy,

R_7 represents hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro, cyano, C_1–C_4-alkylsulphonyl, trifluoromethyl, C_1–C_4-alkylcarbonylamino, benzoylamino which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine or nitro, C_1–C_4-alkoxycarbonyl, or carbamoyl or sulphamoyl which are unsubstituted or monosubstituted or disubstituted by C_1–C_4-alkyl, phenyl or benzyl, said phenyl and said benzyl each being unsubstituted or said phenyl and said benzyl is substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine and nitro,

R_8 represents hydrogen, halogen, C_1–C_4-alkyl, cyano, C_1–C_4-alkoxy, nitro or trifluoromethyl and

R_9 represents hydrogen, chlorine, C_1–C_4-alkyl, C_1–C_4-alkoxy, or a radical of the formula



wherein R_4, R_5 and R_6 have the above-mentioned meanings.

4,288,363

NOVEL AZO DYES HAVING 2-AMINO-5-AMINOMETHYL-7-SULFO NAPHTHALENE COUPLING MOIETY

Rudolf Hurter, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

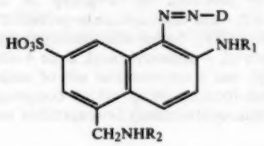
Filed Mar. 23, 1979, Ser. No. 23,514

Claims priority, application Switzerland, Apr. 3, 1978, 3537/78

Int. Cl.³ C09B *29/00, 63/00*

U.S. Cl. 260—155 **6 Claims**

1. Azo dyes of the formula



wherein D represents the radical of a diazo component, R_1 represents hydrogen, an alkyl radical of 1 to 8 carbon atoms or a phenyl radical, and R_2 represents hydrogen or an acyl radical.

4,288,364

FRAGMENTATION PROCEDURE FOR PREPARING 3-AMINO-AZETIDINONES

Karl Schaffner, Oberwil; Hansuli Wehrli, Reinach; Beat Müller, Reinach, and Riccardo Scartazzini, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

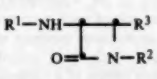
Filed May 15, 1979, Ser. No. 39,239

Claims priority, application Switzerland, May 18, 1978, 5393/78

Int. Cl.³ C07D *205/08, 120/00, 403/06*

U.S. Cl. 260—239 A **14 Claims**

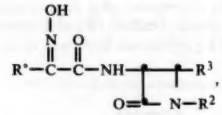
1. A method for the preparation of a 3-amino-2-oxo-azetidine compound of the formula



(I)

in which R^1 denotes hydrogen or a group of the formula R_a.^{1}—O—C(=O)—, in which R_a^1 denotes lower alkyl, oxo-lower

alkyl, halogeno-lower alkyl, cyano-lower alkyl, cycloalkyl, phenyl, phenyl substituted by one to five halogen, one or two lower alkoxy, or one or two nitro, benzyl or diphenylmethyl which can be monosubstituted in the aromatic radical by halogen, lower alkoxy or nitro, R^2 denotes hydrogen, 1-carboxy-lower alkyl, 1-carboxy-1-phenylmethyl, in which the phenyl ring is unsubstituted or monosubstituted to trisubstituted by lower alkyl, halogen, nitro, amino, hydroxy, lower alkoxy, acetoxy, and/or carbamoyloxy, 1-carboxy-1-heterocyclylmethyl, in which heterocyclyl is thienyl, furyl, thiadiazolyl monosubstituted by lower alkyl, or benzthiazolyl, 1-amino-lower alkyl, in which lower alkyl contains one to four C atoms, 1-hydroxy-lower alkyl, in which lower alky contains one to four C atoms and hydroxyl can be replaced by lower alkoxy, acetoxy or carbamoyloxy, 1-carboxy-lower alkenyl, in which lower alkenyl contains two or four C atoms and can be substituted by phenyl or phenylthio, in which groups R^2 the carboxyl group can be replaced by lower alkoxycarbonyl, pivaloyloxymethoxycarbonyl, halogeno-lower alkoxycarbonyl, benzyloxycarbonyl, 4-methoxybenzyloxycarbonyl, 4-nitrobenzyloxycarbonyl, diphenylmethoxycarbonyl, 4,4'-dimethoxydiphenyl-methoxycarbonyl, cycloalkyloxycarbonyl, phenoxycarbonyl, 2- or 4- nitrophenoxycarbonyl, 4-methoxyphenyloxycarbonyl, halogenophenoxycarbonyl, aminocarbonyl, anilinocarbonyl, hydrazinocarbonyl or azidocarbonyl, and in which groups R^2 amino can be substituted by one or two lower alkyl, one acetyl, a group $R_1{}^a$—O—C(=O)—, 2-halogenoacetyl, benzyl, 4-methoxybenzyl, 2- or 4-nitrobenzyl, diphenylmethyl or phthaloyl, and in which groups R^2 hydroxyl can be substituted by lower alkyl, acetyl, carbamoyl, a group $R_1{}^a$—O—C(=O)—, 2-halogenoacetyl, benzyl, 4-methoxybenzyl, 2- or 4-nitrobenzyl or diphenylmethyl, and R^3 denotes hydrogen, hydroxymethyl, wherein hydroxy can be protected by a group $R_1{}^a$—O—C(=O)—, 2-halogenoacetyl, benzyl, 4-methoxybenzyl, 2- or 4-nitrobenzyl or diphenylmethyl, phenyl or 2-phenylvinyl, and a conventional salt of such compound containing a salt-forming group, and/or of a nitrile of the formula R°—CN, in which R° denotes ω-carboxyl-ω-amino-propoxyphenyl, wherein the ω-amino group can be protected by a group of the formula $R_1{}^a$—O—C(=O)— and carboxyl can be protected in esterified form by lower alkyl, lower alkanoyloxymethyl, 2,2,2-trichloroethyl, benzyl, 4-methoxybenzyl, 2- or 4-nitrophenyl or diphenylmethyl, and a conventional salt of such compound containing a salt-forming group, which comprises treating a 3-(2-hydroxyimino-acetylamino)-2-oxoazetidine compound of the formula



(II)

in which R_2 and R_3 are as defined above and R° denotes phenyl, hydroxyphenyl, lower alkoxyphenyl, lower alkenyloxyphenyl, aralkyloxyphenyl, lower alkoxycarbonyl-lower alkoxyphenyl, carboxy-lower alkoxyphenyl, ω-carboxy-ω-hydroxy-lower alkoxyphenyl, ω-carboxy or ω-lower alkoxycarbonyl-lower alkoxyphenyl, ω-amino-lower alkoxyphenyl, ω-carboxy-ω-amino-lower alkoxyphenyl, furyl, thienyl, thiazolyl, which heterocyclic radicals can be monosubstituted by hydroxy, halogen or amino, in which groups R° hydroxy and amino groups can be protected by a group $R_1{}^a$—O—C(=O)—, and carboxy can be protected in esterified form by lower alkyl, lower alkanoyloxymethyl, 2,2,2-trichloroethyl, benzyl, 4-methoxybenzyl, 2- or 4-nitrobenzyl or diphenylmethyl, or a conventional salt of such a compound containing a salt forming group, in an aqueous medium in the presence of a base, with a compound which is an anhydride or a mixed anhydride with a hydrogen halide of a carbonic acid half-ester of the formula $R_1{}^a$—O—C(=O)—OH, in which $R_1{}^a$ is as defined above, isolating a compound of the formula I, wherein R^1 is a group of the formula $R_a{}^1$—O—C(=O)—, and/or isolating a nitrile R°—CN, in which R° denotes ω-carboxyl-ω-aminopropoxyphenyl, wherein the ω-amino group can be protected by a group of the formula $R_1{}^a$—O—C(=O)— and carboxyl can be protected in esterified form by lower alkyl, lower alkanoyloxymethyl, 2,2,2-trichloroethyl, benzyl, 4-methoxybenzyl, 2- or 4-nitrophenyl, or diphenylmethyl and, if desired in a resulting compound liberating the protected hydroxy, amino and/or carboxy groups present by detaching the protective groups, or protecting in a conventional form free hydroxy, amino and/or carboxy groups present, and, when required, converting a resulting compound containing a salt-forming group to a conventional salt or converting a resulting salt to a free compound.

4,288,365

PYRIDO DERIVATIVES

Robert W. Morrison, Jr.; William R. Mallory, and Virgil L. Styles, all of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

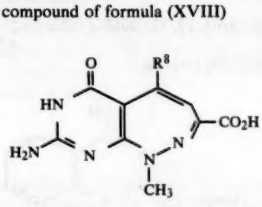
Division of Ser. No. 926,072, Jul. 19, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 76,406

Claims priority, application United Kingdom, Jul. 20, 1977, 30380/77

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/505*

U.S. Cl. 260—243.3 **6 Claims**

1. A compound of formula (XVIII)



(XVIII)

a tautomer or a salt thereof wherein R^8 is lower alkyl, pyridyl, phenyl or phenyl substituted by one or more hydroxy or lower alkoxy.

4,288,366

METHOD OF PREPARATION OF 5,6-DEHYDROPENICILLINS

Luciano Re; Alberto Brant, both of Rome, and Luciano Bassignani, Passo Corese, all of Italy, assignors to Snamprogetti, S.p.A., Switzerland

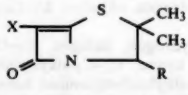
Division of Ser. No. 949,546, Oct. 10, 1978, abandoned, which is a division of Ser. No. 769,527, Feb. 17, 1977, Pat. No. 4,133,807. This application Jul. 19, 1979, Ser. No. 58,945

Claims priority, application Italy, Feb. 23, 1976, 20451 A/76

Int. Cl.[3] **C07D** *499/00*

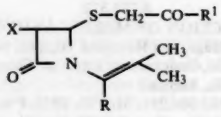
U.S. Cl. 260—245.2 R **7 Claims**

1. A method of preparing dehydropenicillins of the formula

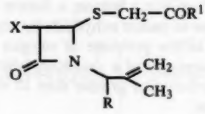


wherein X is an aminic group which may be substituted with at least one member selected from the group consisting of aralkyl and acyl and R is a carboxyl group or a salt, an amide, an ester, or thioester thereof comprising:

(a) irradiating a compound of the formula



or of the formula



wherein R^1 is selected from the group consisting of alkyl, aryl, and aralkyl and X and R are the same as defined above, in the presence of an inert gas and in an inert anhydrous oxygen-free solvent selected from aromatic solvents and acetonitrile at a temperature of from −10° C. to 40° C.; and

(b) treating said irradiated compound with triethylamine in the presence of a halogen-substituted aliphatic solvent or an aromatic solvent at a temperature of −10° C. +40° C.

4,288,367

2-CYANO-2-CARBOXY-3-AZABICYCLO[3.1.0]HEXANE, HYDRATES, ESTERS, AND SALTS THEREOF

Janet A. Day, and Robert J. G. Searle, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

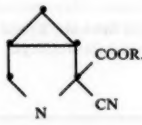
Filed Oct. 28, 1980, Ser. No. 201,106

Claims priority, application United Kingdom, Nov. 16, 1979, 39782/79

Int. Cl.³ A01N *43/38;* C07D *209/52*

U.S. Cl. 260—326.27 **1 Claim**

1. A member selected from the group consisting of compound of the formula



in which R is a hydrogen atom or alkyl of from 1 to 4 carbon atoms, the hydrates, and alkali metal salts of the acid, and the hydrochloride salts of the acid and esters.

4,288,368

DITHIOACYLPROLINE DERIVATIVES

Rudiger D. Haugwitz, Titusville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 30, 1979, Ser. No. 61,729

Int. Cl.³ C07D *207/16, 409/12*

U.S. Cl. 260—326.35 **2 Claims**

1. (S)-1-[2-Methyl-1-oxo-3-[(2-thienylthioxomethyl)-thio]-propyl]-L-proline.

2. (S)-1-[2-Methyl-1-oxo-3-[(1-thioxooctadecyl)thio]-propyl]-L-proline.

4,288,369

PRODUCTION OF CYCLIC ETHERS

Norman L. Holy, Bowling Green, Ky., and Theodore E. Nalesnik, Cincinnati, Ohio, assignors to Western Kentucky University, Bowling Green, Ky.

Continuation-in-part of Ser. No. 816,941, Jul. 19, 1977, abandoned. This application Aug. 31, 1979, Ser. No. 71,667

Int. Cl.³ C07D *307/08, 307/06, 309/04, 313/04*

U.S. Cl. 260—333 **18 Claims**

1. A process for the preparation of an unsubstituted cyclic ether which comprises reacting an unsubstituted alkanediol in which the hydroxyl groups are separated by a chain of at least four carbon atoms in the liquid phase, in a molecular oxygen gaseous atmosphere, at a temperature of from about 150° C. to 300° C. in the presence of a catalytic amount of a catalyst comprising about 0.45 to 0.71 grams of palladium in a palladium salt, about 0.30 to 1.2 grams of copper in a copper salt and about 0.30 to 1.1 grams of chloride ion, all per mole of alkanediol.

4,288,370

HALOGENOVINYL-SUBSTITUTED TETRA-HYDROFURAN-2-ONES

Hans-Georg Heine, Krefeld; Armin Hübner, Toenisvorst, and Willy Hartmann, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

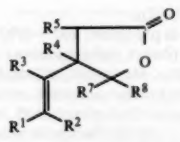
Division of Ser. No. 936,988, Aug. 25, 1978, Pat. No. 4,225,704. This application Oct. 30, 1979, Ser. No. 89,344

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1977, 2740849

Int. Cl.³ C07D *307/32*

U.S. Cl. 260—343.6 **1 Claim**

1. A halogenovinyl-substituted tetrahydrofuran-2-one of the formula



in which

R^1 and R^2 each independently is hydrogen, chlorine, bromine, fluorine or alkyl or 1 to 4 carbon atoms,

R^3 is chlorine, bromine or fluorine,

R^4 is hydrogen or alkyl or 1 to 4 carbon atoms,

R^5 is hydrogen, chlorine, bromine or fluorine and

R^7 and R^8 each independently is methyl or ethyl or together are $—(CH_2)_3—$, $—(CH_2)_4—$ or $—(CH_2)_5—$.

4,288,371

19-HYDROXY-19-METHYL-6,7-DIDEHYDRO-PGI$_1$ COMPOUNDS

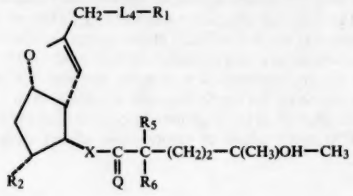
John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,507. This application Mar. 3, 1980, Ser. No. 126,505

Int. Cl.^{3} C07D *307/935*

U.S. Cl. 260—346.22 **6 Claims**

1. A prostacyclin-type compound of the formula



wherein L_4 is

(1) $—(CH_2)_n—$, wherein n is one to 5, inclusive, or

(2) $—(CH_2)_p—CF_2—$, wherein p is 2, 3, or 4,

wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4:β-OH,

wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_1 is

(1) $—COOR_3$,

(2) $—CH_2OH$,

(3) $—CH_2N(R_7)(R_8)$,

(4) $—CO—N(R_7)(R_8)$,

(5) $—CO—NH—SO_2—R_{15}$, or

(6) tetrazolyl,

wherein R_3 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;

(g) $—(p—Ph)—CO—CH_3$,

(h) $—(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3$,

(i) $—(p—Ph)—NH—CO—(Ph)$,

(j) $—(p—Ph)—NH—CO—CH_3$,

(k) $—(p—Ph)—NH—CO—NH_2$,

(l) $—(p—Ph)—CH{=}N—NH—CO—NH_2$,

(m) β-naphthyl,

(n) $—CH_2—CO—R_{16}$,

wherein —(Ph)— is phenylene and —(Ph) is phenyl;

wherein R_{16} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation; wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, and wherein R_{15} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, phenyl, phenyl-substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive,

wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl,

wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and

wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) $—C{\equiv}C—$, or

(4) $—CH_2CH_2—$.

4,288,372

PRODUCTION OF MALEIC ANHYDRIDE

Graham J. Hutchings, and Raymond Higgins, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 906,251, May 15, 1978, Pat. No. 4,209,423. This application Dec. 4, 1979, Ser. No. 100,141

Claims priority, application United Kingdom, May 23, 1977, 21610/77; Jan. 30, 1978, 3686/78

Int. Cl.^{3} C07D *307/60*

U.S. Cl. 260—346.75 **1 Claim**

1. A process of oxidizing butane, a butene or a mixture of butane and a butene to maleic anhydride by contacting it in the vapor phase and in the presence of oxygen with a catalyst which consists essentially of a vanadium/phosphorous mixed oxide having a surface area greater than 10 m^2/g and lanthanum as a promoter.

4,288,373

CERTAIN N,N'-BIS-TETRAHYDROFURYL-2-HALO-SUCCINAMIDES

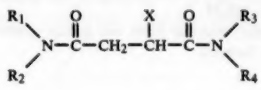
Francis H. Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 93,358, Nov. 13, 1979, which is a continuation of Ser. No. 960,379, Nov. 13, 1978, abandoned, which is a division of Ser. No. 821,688, Aug. 4, 1977, Pat. No. 4,143,070, which is a division of Ser. No. 546,234, Feb. 3, 1975, Pat. No. 4,056,524, which is a continuation-in-part of Ser. No. 459,438, Apr. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 410,641, Nov. 12, 1973, abandoned. This application May 19, 1980, Ser. No. 151,017

Int. Cl.^{3} C07D *307/22*

U.S. Cl. 260—347.3 **3 Claims**

1. A compound in which the formula is



wherein X is chlorine or bromine; R_1 and R_3 are each alkyl and R_2 and R_4 are each tetrahydrofurfuryl.

4,288,374

SYNTHESIS OF 3-BUTEN-1-OL, 3,4-DICHLOROBUTAN-1-OL AND 3-CHLOROTETRAHYDROFURAN

Edward N. Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 74,097, Sep. 10, 1979. This application Jul. 28, 1980, Ser. No. 173,097

Int. Cl.^{3} C07C *29/16, 29/62;* C07D *307/18*

U.S. Cl. 260—347.91 **5 Claims**

1. A process for preparing 3-buten-1-ol from propylene and formaldehyde, the process comprising

reacting propylene and aqueous formaldehyde stabilized with alcohol in the presence of silica sand at a temperature of from 250°-350° C., and a pressure of from 50-800 atmospheres in the absence of oxygen at a ratio of propylene to formaldehyde of at least 1:1.

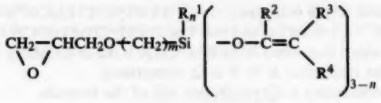
4,288,375

NOVEL ORGANOSILANE COMPOUNDS

Masatoshi Arai, and Koji Futatsumori, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1980, Ser. No. 162,534
Claims priority, application Japan, Jun. 29, 1979, 54-82451
Int. Cl.[3] C07D 303/02
U.S. Cl. 260—348.41 5 Claims

1. An organosilane compound represented by the general formula



in which

R^1 is selected from the class consisting of methyl, ethyl and phenyl groups,

R^2 is a methyl or an ethyl group,

R^3 and R^4 are each a hydrogen atom or a methyl group,

m is 3 or 5, and

n is zero or 1.

4,288,376

PROCESS FOR PREPARING HEXAFLUOROPROPENE OXIDE

Yohnosuke Ohsaka, Takatsuki, and Takashi Tohzuka, Settsu, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Jul. 18, 1980, Ser. No. 170,153
Claims priority, application Japan, Jul. 18, 1979, 54/91827
Int. Cl.[3] C07D 301/08
U.S. Cl. 260—348.23 3 Claims

1. A process for preparing hexafluoropropene oxide which comprises reacting hexafluoropropene with oxygen in the presence of at least one barium compound selected from the group consisting of barium oxide, barium hydroxide and inorganic barium salt as a catalyst at a temperature of from 100° to 350° C.

4,288,377

PROCESS FOR PURIFICATION OF WOOL GREASE

Norair S. Arutjunian, ulitsa Krasnaya, 143/1, kv. 35; Evgenia A. Arisheva, ulitsa Kotovskogo, 92, kv. 22, both of Krasnodar; Nikolai V. Rogachev, pereulok Sportivny, 17, and Lidia G. Vasilievna, ulitsa Matrosova, 153a, kv. 57, both of Nevinnomyssk Stavropolskogo kraya, all of U.S.S.R.

Filed Jun. 27, 1980, Ser. No. 163,739
Int. Cl.[3] C11B 1/10; C07J 9/00
U.S. Cl. 260—397.25 4 Claims

1. A process for purification of wool grease comprising mixing the grease miscelle in a hydrocarbon solvent with an alcohol in a ratio of from 10:1 to 10:4, mixing an aqueous alkali solution with an alcohol in a ratio of water: alkali:alcohol of 60–75:2–5:20–35, neutralization of free fatty acids by dispersing said mixture of the miscelle with said alcohol in said aqueous-alcoholic alkali solution, followed by separation of the formed phases by settling.

4,288,378

METHOD OF PREPARING AN ENRICHED PEANUT OIL PEANUT BUTTER STABILIZER

Cornelis H. Japikse, and Irwin B. Simon, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 23, 1979, Ser. No. 41,668
Int. Cl.[3] C11C 3/12; A23D 5/00
U.S. Cl. 260—409 9 Claims

1. A method of preparing an enriched, hydrogenated peanut-oil based peanut butter stabilizer comprising the steps of:

(a) randomly interesterifying (randomizing) a first mixture of from about 0% to about 70% hydrogenated peanut oil (hardstock) and from about 30% to about 100% unhydrogenated peanut oil;

(b) fractionally crystallizing from the randomly interesterified first mixture a second mixture of triglycerides having at least 10% long chain fatty acids having from 20 to 24 carbon atoms; and

(c) substantially completely hydrogenating said second mixture to an iodine value less than about 8 to form said enriched hydrogenated peanut oil-based peanut butter stabilizer.

4,288,379

HYDROCARBON POLYL GEM-BIS(T-ALKYLPEROXY)ALKANOATES DERIVED FROM β-KETO-ACIDS

Duane B. Priddy, Coleman, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 31, 1977, Ser. No. 802,216
Int. Cl.[3] C07C 179/06
U.S. Cl. 260—410.6 8 Claims

1. A hydrocarbon polyl gem-bis(t-alkylperoxy)alkanoate which has a one-hour half-life of at least about 130° C. and corresponds to the formula:

wherein R is an x-valent hydrocarbon whose chain length may be interrupted by one or more ether linkages;

R′ is an aliphatic moiety of 1 to about 10 carbon atoms;

R″ is a tertiary hydrocarbon; and

x is an integer of at least 2.

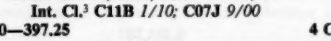
4,288,380

HETERONUCLEAR-BRIDGED RHODIUM CLUSTERS

Ernst Billig; Jackie D. Jamerson, both of Charleston, W. Va., and Roy L. Pruett, New Providence, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 1, 1979, Ser. No. 90,140
Int. Cl.[3] C07F 15/00
U.S. Cl. 260—429 R 18 Claims

1. A heteronuclear-bridged rhodium cluster compound having the generic formula



wherein E and E′ each individually represent a Group VA element selected from the group consisting of phosphorus, arsenic or antimony; wherein R and R′ each individually represent a monovalent organic radical selected from the group consisting of alkyl, cycloalkyl, aryl, alkoxy and aryloxy radicals; wherein f has a value of from 2 to 6, m has a value of from 1 to 6, p has a value of from 1 to 6 and q has a value of from 1 to 6.

4,288,381

METHOD FOR THE SYNTHESIS OF ALKOXYALANATES OF ALKALINE-EARTH METALS

Giovanni Dozzi, Milan, and Salvatore Cucinella, S. Donato Mi, both of Italy, assignors to Anic S.p.A., Palermo, Italy

Filed Mar. 26, 1980, Ser. No. 134,093
Claims priority, application Italy, Apr. 4, 1979, 21566 A/79
Int. Cl.³ C07F *5/06*
U.S. Cl. 260—448 AD **6 Claims**

1. A process for synthesizing alkoxyalanates of alkaline earth metals of the formula:

$$M[AlH_{4-n}(OR)_n]_2.mB$$

in which M represents the alkaline earth metal, OR represents an alkoxy group of a primary, secondary or tertiary alcohol in which R is an aliphatic, cycloaliphatic or aromatic radical, n is a number between 0.5 and 3.5, B is a Lewis base, m is a number between 0 and 4, and R can also contain functional groups such as OR′, SR′, NR′$_2$, said R′ being the same as R consisting of reacting together (a) an alkali metal alanate, (b) a halide of the alkaline earth metal, (c) an alcoholate of the alkaline earth metal, and (d) an aluminium alcoholate.

4,288,382

REVERSIBLE ADDUCTS OF ISOCYANATES WITH BORON COMPOUNDS

Luigi Giuffre, Milan, Italy, and Placido M. Spaziante, Lugano, Switzerland, assignors to Vertac, Inc., Memphis, Tenn.

Filed Oct. 10, 1979, Ser. No. 83,400
Int. Cl.³ C07C *119/042*
U.S. Cl. 260—453 A **20 Claims**

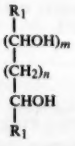
1. An adduct of:

(1) an isocyanate having the formula

$$R{-}N{=}C{=}O$$

wherein R is a member selected from the group consisting of alkyl having from 1 to 10 carbon atoms and alkenyl having 2 to 6 carbon atoms with

(2) a boron compound having at least one free =B—OH group selected from the group consisting of (a) polyol borates essentially free of alcoholic hydroxyl groups prepared from boric acid and polyols having at least two alcoholic hydroxyl groups selected from the group consisting of (i) compounds having the formula



wherein R_1 is a member selected from the group consisting of hydrogen, lower alkyl, and hydrocarbon aryl, n is 0 or an integer from 1 to 4, and m is 0 or an integer from 1 to 5, (ii) pentaerythritol, (iii) lower alkyl ethers of (i) or (ii), and (iv) lower alkanoic acid esters of (i) or (ii), and (b) metaboric acid.

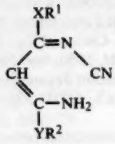
4,288,383

PROPENIMIDATES, THEIR PREPARATION AND REARRANGEMENT TO PYRIMIDINES

Julius J. Fuchs, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 67,354, Aug. 14, 1979, Pat. No. 4,235,802. This application Apr. 24, 1980, Ser. No. 143,373
Int. Cl.³ C07C *125/08, 119/18*
U.S. Cl. 260—453 RW **7 Claims**

1. A process for preparing a compound of the formula:

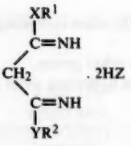


wherein

X and Y are independently O or S; and

R^1 and R^2 are independently C_1–C_4 alkyl, $(CH_2)_nOR^3$ where R^3 is C_1–C_4 alkyl and n is 1 or 2, CH_2CH_2Cl or CH_2CF_3, provided that when R^1 of R^2 is CH_2CH_2Cl or CH_2CF_3, then the respective X or Y is O, comprising:

(a) contacting a dihydrohalide salt of the formula:



wherein X, Y, R^1 and R^2 are as defined above and Z is F, Cl or Br, in an inert liquid medium with one equivalent weight of a base at a pH no higher than about 7, to produce a monohydrohalide salt; and,

(b) contacting the monohydrohalide salt with cyanamide.

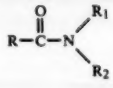
4,288,384

N-CYANOALKYL HALOACETAMIDES HERBICIDAL ANTIDOTES

Francis H. Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 7, 1979, Ser. No. 73,392
Int. Cl.³ C07C *121/46, 121/14*
U.S. Cl. 260—464 **39 Claims**

1. A compound of the formula



in which

R is 1–4 carbon haloalkyl wherein halo is bromo or chloro:

R_1 is selected from the group consisting of hydrogen and 1–4 carbon alkyl; and

R_2 is selected from the group consisting of 5–12 carbon cyanoalkylcycloalkyl, 5–12 carbon cyanocycloalkyl, and 3–6 carbon cyanoalkylalkoxy.

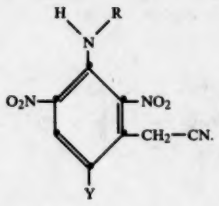
4,288,385

2,6-DINITROANILINE HERBICIDES AND USE THEREOF

Albert W. Lutz, Princeton, and Robert E. Diehl, Lawrenceville, both of N.J., assignors to American Cyanamid Co.

Filed Jul. 25, 1979, Ser. No. 60,532
Int. Cl.³ A01N *37/34*; C07C *121/52*
U.S. Cl. 260—465 E **12 Claims**

1. A compound of formula:



wherein R is secondary alkyl C_3–C_7 free from quaternary carbon atoms optionally monosubstituted with OCH_3 or Cl; and Y is CH_3, C_2H_5, C_3H_7—n, or C_3H_7—i.

4,288,386

ULLMANN REACTION FOR THE SYNTHESIS OF DIARYL ETHERS

Gerard Soula, Meyzieu, and Louis Linguenheld, Saint-Genis-Laval, both of France, assignors to Rhone-Poulenc Industries, Paris, France

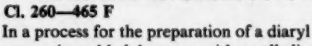
Filed May 12, 1980, Ser. No. 148,590

Claims priority, application France, May 18, 1979, 79 12688

Int. Cl.³ C07C *41/00, 65/21, 69/94, 121/75*

U.S. Cl. 260—465 F **26 Claims**

1. In a process for the preparation of a diaryl ether by reacting an unactivated halobenzene with an alkali metal phenolate in the presence of a copper catalyst, the improvement which comprises conducting said reaction in the presence of an effective amount of at least one tertiary amine sequestering agent having the formula:



(I)

in which n is an integer which is greater than or equal to 0 and less than or equal to about 10, R_1, R_2, R_3 and R_4, which are identical or different, each represent a hydrogen atom or an alkyl radical having from 1 to 4 carbon atoms and R_5 represents an alkyl or cycloalkyl radical having from 1 to 12 carbon atoms, a phenyl radical or a radical $-C_mH_{2m}-\phi$ or $C_mH_{2m+1}-\phi-$, wherein ϕ is phenyl and in which m is between 1 and 12.

22. The process as defined by claim 1 for the preparation of meta-phenoxytoluene by reacting sodium meta-cresolate with chlorobenzene, in the presence of cuprous chloride, said reaction being conducted in the presence of a tertiary amine selected from the group consisting of tris-(3,6-dioxaoctyl)-amine and tris-(3,6-dioxaheptyl)-amine.

4,288,387

PROCESS FOR THE PREPARATION OF CYCLOPROPANE CARBOXYLIC ACID ESTERS

John Crosby, Cheshire; David Holland, Cheshire; Dale A. Laidler, Cheshire, and David J. Milner, Manchester, all of England, assignors to Imperial Chemical Industries Limited, London, England

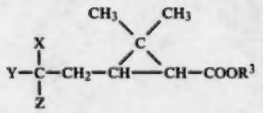
Filed Jun. 2, 1980, Ser. No. 156,077

Claims priority, application United Kingdom, Jul. 13, 1979, 24521/79

Int. Cl.³ C07C *69/74, 121/75*

U.S. Cl. 260—465 D **10 Claims**

1. A process for the preparation of a compound of the formula:



(I)

wherein

R^3 is an alkyl, 3-phenoxybenzyl, α-cyano-3-phenoxybenzyl or α-ethyl-3-phenoxybenzyl group,

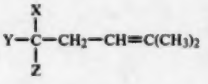
Z is fluorine, chlorine or bromine, and

X and Y, which may be the same or different, are fluorine, chlorine, bromine, lower alkyl or $Q(CF_2)_m$-, in which Q is hydrogen, fluorine or chlorine and m is 1 or 2, or

in which each of U, V and W are independently hydrogen, fluorine or chlorine except that where one of X and Y is a group of formula $Q(CF_2)_m$- where Q is as defined above, the other of X and Y is fluorine, chlorine or bromine or a group

as previously defined,

characterised in that a compound having the formula:



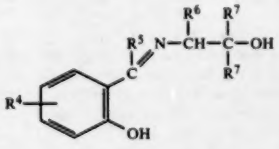
(II)

is reacted with an alkyl diazoacetate $N_2CH.COOR^3$, R^3, X, Y and Z having the previously defined meanings, in the presence of a catalyst selected from the following classes (i) to (vi):

(i) metallic copper, or a copper(II) salt,

(ii) rhodium(II) salts of carboxylic acids,

(iii) the copper complex of a chiral Schiff base having the formula:



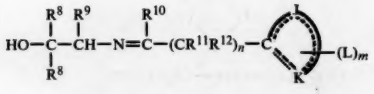
(III)

in which

R^4 is hydrogen, alkyl, aralkyl, aryl or a substituent containing a hetero atom, or R^4, when taken with the aromatic nucleus to which it is attached, forms a naphthalene ring system,

R^5 is hydrogen, alkyl, aralkyl or aryl and R^6 and R^7 are each alkyl, aralkyl or aryl,

(iv) the transition metal complex of a chiral Schiff base having the general formula:



(IV)

wherein

R^8 and R^9, which may be the same or different, are alkyl, aralkyl or aryl;

R^{10} is hydrogen or lower alkyl, aryl, aralkyl or alkaryl,

R^{11} and R^{12}, which may be the same or different are hydrogen or lower alkyl, or where n is 1, may with the cyclic system to which $CR^{11}R^{12}$ is attached, form a fused ring system,

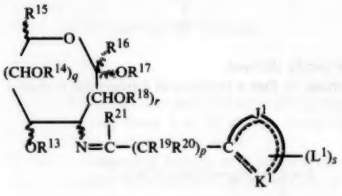
J is a chain of 3 or 4 atoms consisting either exclusively of carbon atoms or of carbon atoms together with one or more hetero-atoms which may be the same or different, which chain with the group —C K— forms an aromatic system,

K is nitrogen, N→O or —NH—,

L, each of which may be the same or different, represents a substituent attached to a carbon atom in the chain J and is hydrogen, alkyl, aralkyl, aryl or a substituent containing a hetero-atom, or two groups L together with the ring to which they are attached, form a fused ring system,

n is 0, 1 or 2, and m is the number of carbon atoms in the chain J,

(v) the transition metal complex of a chiral Schiff base having the general formula:



(V)

wherein

R^{13}, R^{14}, and R^{18}, which may be the same or different, are hydrogen or lower alkyl, except that at least one of R^{13} and R^{18} is hydrogen,

R^{15} is hydrogen, a sugar derivative or $—CH_2OR^{22}$ in which R^{22} is hydrogen, lower alkyl or together with R^{14} forms a divalent hydrocarbon group,

R^{16} is hydrogen or $—CH_2OH$,

R^{17} is hydrogen, lower alkyl or a sugar derivative,

R^{19} and R^{20}, which may be the same or different, are hydrogen or lower alkyl, or where p is 1, may with the cyclic system to which $CR^{19}R^{20}$ is attached form a fused ring system,

R^{21} is hydrogen, alkyl, aralkyl or aryl,

J^1 is a chain of 3 or 4 atoms consisting either exclusively of carbon atoms or of carbon atoms together with one or more hetero atoms which may be the same or different, which chain with the group —C═K— forms an aromatic system,

K is C-OH, nitrogen, N→O or —NH—,

L^1, each of which may be the same or different, represents a substituent attached to a carbon atom in the chain J^1 and is hydrogen, alkyl, aralkyl, aryl or a substituent containing a hetero-atom, or two groups L^1 together with the ring to which they are attached form a fused ring system,

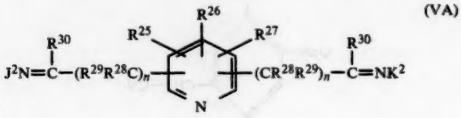
r is 0 or 1,

q is 0, 1 or 2, provided that q+r is 1, 2 or 3,

p is 0, 1 or 2, and

s is the number of carbon atoms in the chain J^1, and

(vi) the transition metal complex of a chiral Schiff base having the general formula:



(VA)

wherein

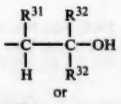
R^{25}, R^{26} and R^{27}, which may be the same or different, are hydrogen, alkyl, aralkyl, aryl, a substitutent containing a hetero atom, or two of R^{25}, R^{26} and R^{27} together with the pyridine ring from a fused ring system,

R^{28} and R^{29}, which may be the same or different, are hydrogen, lower alkyl, or, where n is 1, may with the pyridine ring to which $C^{28}R^{29}$ is attached, form a fused ring system,

R^{30} is hydrogen, alkyl, aralkyl or aryl,

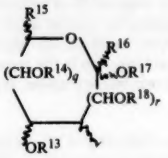
n is 0, 1 or 2

and J^2 and K^2, which may be the same or different, are groups of the formulae:



(VB)

or



(VC)

in which R^{31} and R^{32}, which may be the same or different, are alkyl, aralkyl or aryl, and R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, q and r have the previously defined meanings, and the corresponding compounds having an oxygen atom attached to the pyridine ring nitrogen.

4,288,388

BLEACHING COMPOSITION

Joseph E. McCrudden, Warrington, and Alan Smith, Chester, both of England, assignors to Interox Chemicals Limited, London, England

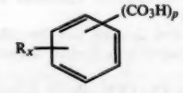
Division of Ser. No. 857,602, Dec. 5, 1977, Pat. No. 4,225,451, which is a continuation of Ser. No. 683,656, May 6, 1976. This application Nov. 14, 1979, Ser. No. 94,052

Claims priority, application United Kingdom, Nov. 18, 1975, 47372/75

Int. Cl.[3] **C07C** *179/133, 179/10*

U.S. Cl. 260—502 R **2 Claims**

1. A compound having the general formula:



wherein R is selected from the group consisting of lower alkyl, chloro and nitro, x is 0, 1, 2 or 3 and p is 3 or 4, or an anion of said compound.

4,288,389

PROCESS FOR SEPARATING SULFONIC ACIDS FROM THE REACTION PRODUCTS OBTAINED WHEN PARAFINS ARE REACTED WITH SULFUR DIOXIDE, OXYGEN AND WATER IN THE PRESENCE OF ULTRA-VIOLET LIGHT

Hermann Springmann, Haltern, Fed. Rep. of Germany, assignor to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,623

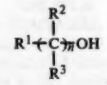
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004651

Int. Cl.[3] C07C *139/00*

U.S. Cl. 260—504 S 4 Claims

1. A process for separating the sulfonic acids in an untreated paraffin sulfonic solution containing in addition to said paraffin sulfonic acids, sulfuric acid, water and non-sulfonated paraffins, which comprises:

(a) admixing with the paraffin sulfonic acid solution, at least one aromatic alcohol having the general formula



wherein:

R^1 is a phenyl group, said phenyl group possibly substituted by halogen and/or alkyl groups having 1 to 6 C atoms;

R^2 and R^3 are hydrogen;

n is an integer from 1 to 3; and

R^2 is a methyl group when n=1, thereby forming a mixture having three phases wherein the uppermost layer consists essentially of unreacted paraffins, the center layer consists essentially of paraffin sulfonic acids and the lower layer consists essentially of an aqueous solution of sulfuric acid;

(b) separating said center layer; and

(c) said aromatic alcohol is separated from said center layer to produce said sulfonic acids.

4,288,390

PREPARATION OF N-(AMINOMETHYL)-α,β-ETHYLENICALLY UNSATURATED CARBOXAMIDES AND THEIR POLYMERS

Charles J. McDonald, Midland, Mich., assignor to The Dow Chemical Co., Midland, Mich.

Continuation-in-part of Ser. No. 856,704, Dec. 2, 1977, Pat. No. 4,166,828. This application Jun. 1, 1979, Ser. No. 44,436

The portion of the term of this patent subsequent to Sep. 4, 1996, has been disclaimed.

Int. Cl.[3] C07C *102/00*

U.S. Cl. 564—204 11 Claims

1. A process for preparing a cationic N-(aminomethyl)-α,β-ethylenically unsaturated carboxamide which comprises contacting a reaction mixture comprising an N-alkylol and/or an N-alkoxyalkyl derivative of an α,β-ethylenically unsaturated carboxamide with an amine under conditions including a pH of less than about 7 sufficient to cause reaction of the derivative and amine to form at least 10 mole percent of cationic carboxamide based on moles of the derivative.

4,288,391

ALKYLATED 2,2'-BIPHENYLENE PHOSPHITES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

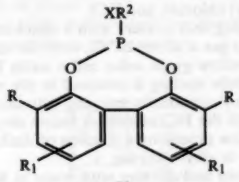
Continuation-in-part of Ser. No. 866,748, Jan. 3, 1978, Pat. No. 4,196,117. This application Nov. 13, 1979, Ser. No. 93,786

The portion of the term of this patent subsequent to Apr. 1, 1997, has been disclaimed.

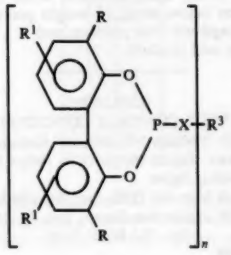
Int. Cl.[3] C07F *9/15*

U.S. Cl. 260—927 R 8 Claims

1. A 1,1'-biphenyl-2,2'-diyl phosphite of the formula



or



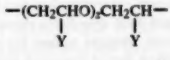
wherein

R is an alkyl group of 1 to 18 carbon atoms,

R^1 is hydrogen or alkyl group of 1 to 18 carbon atoms, and

R^2 is an alkyl group of 1 to 20 carbon atoms, phenyl, phenyl substituted by 1 to 3 alkyl groups each having 1 to 8 carbon atoms, or by two alkyl groups each having 1 to 8 carbon atoms and by —$COOR^4$ where R^4 is alkyl of 1 to 18 carbon atoms,

R^3 is an n-valent radical selected from the group consisting of a straight- or branched-chain alkylene of 2 to 12 atoms, a straight- or branched chain alkane-triyl, -tetrayl, -pentayl or -hexayl of 3 to 6 carbon atoms, alkylene of 4 to 6 carbon atoms, cycloalkylene of 6 to 12 carbon atoms, 1,4-cyclohexanedimethylene, arylene or arylene or arenetriyl of 6 to 10 carbon atoms, p-xylylene, phenylene-E-phenylene where E is a direct bond, —O—, —S—, —NR^5—, where R^5 is alkyl of 1 to 18 carbon atoms; a straight- or branched chain alkylene or alkylidene of 1 to 12 carbon atoms or cycloalkylidene of 5 to 6 carbon atoms, said arylene or said phenylene-E-phenylene substituted by 1 to 4 alkyl groups each having 1 to 8 carbon atoms, $—(CH_2)_xX(CH_2)_x$ where x is 2 to 6, dipentaerythrityl, and



where

Y is hydrogen, methyl or ethyl and z is 1 to 10,

X is oxygen or sulfur, and n is 2 to 6.

4,288,392

PROCESS FOR THE PREPARATION OF DIALKYL PHOSPHORIC ACIDS

James M. Horn, Richmond, Va.; Byron E. Johnston, Skillman, N.J.; Roger P. Napier, Califon, N.J., and Thomas N. Williams, Plainfield, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 3, 1980, Ser. No. 109,371
Int. Cl.³ C07F 9/09
U.S. Cl. 260—983 **5 Claims**

1. A process to produce dialkyl phosphoric acid that comprises:

(a) reacting PCl_3 with C_1–C_{12} alkanol in a molar ratio of said alkanol:PCl_3 of 3 at 10°–15° C., under an inert gas atmosphere, to produce a mixture of bis-(alkyl) hydrogen phosphite, alkyl chloride, and HCl;

(b) chlorinating said mixture with a stoichiometric amount of chlorine gas at about 20° C., until the reaction mixture attains a yellow-green color and a stable Platinum-Calomel electrode reading is obtained in the range of about 880–910 m.v.; optionally sparging with inert gas at about 50° C. until the HCl content is below about one weight percent, thus producing a solution of dialkyl phosphorochloridate in alkyl chloride;

(c) hydrolyzing said solution with water at 80°–100° C. for about 4–6 hours, using sufficient water to effect a final HCl content below about 11 weight percent, to produce dialkyl phosphoric acid product; and

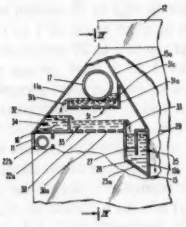
(d) separating said product.

4,288,393

DIRECT CONTACT CONDENSER

Hideki Sekiguchi; Michizo Miyoshi, and Katsutoshi Yonemura, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 14, 1980, Ser. No. 149,565
Claims priority, application Japan, Jun. 30, 1979, 54-82817
Int. Cl.³ B01F 3/04
U.S. Cl. 261—108 **5 Claims**



1. A direct contact condenser comprising:

a horizontally elongated housing;

partition means extending longitudinally within said housing and also extending from a top portion toward a middle portion of said housing for defining a steam inlet means in the top of said housing, downward passage means, lateral passage means, and collectively upward passage means for establishing the sequential steam flows within said housing;

first overflow means extending longitudinally within said housing at its top portion above collectively upward passage means for temporarily accumulating cooling liquid fed to said condenser and for allowing excess accumulated cooling liquid to overflow;

second overflow means extending longitudinally within said housing under said first overflow means and above said collectively upward passage means for temporarily accumulating the cooling liquid supplied from said first overflow means, for allowing the cooling liquid to fall in multiple streams into said collectively upward passage means to cause direct heat exchange between the falling cooling liquid and the steam, and for causing excess cooling water accumulated by said second overflow means to overflow;

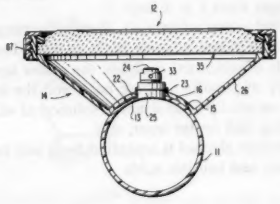
means for supplying the cooling liquid overflowing from said second overflow means to said downward passage means to cause direct heat exchange between the cooling liquid and the steam in said downward passage means when excess accumulated cooling liquid overflows from said second overflow means.

4,288,394

SEWAGE AERATION SYSTEM

Lloyd Ewing, Bayside; David T. Redmon, Racine; Paul M. Thayer, Milwaukee; Frank L. Schmit, Port Washington, and William H. Roche, Mequon, all of Wis., assignors to Water Pollution Control Corp., Milwaukee, Wis.

Continuation-in-part of Ser. No. 952,891, Oct. 19, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 102,175
Int. Cl.³ B01F 3/04
U.S. Cl. 261—122 **48 Claims**



1. A sewage aeration system comprising:

a horizontally extending header pipe having an upper surface which is arcuate in transverse cross-section and having air outlet openings in said arcuate upper surface at spaced points along the length of said header pipe;

a plurality of synthetic thermoplastic or thermoset resin plenums secured to said arcuate upper surface at spaced points along said header pipe in communication with said air outlet openings;

said plenums having wall means, including side wall means extending transversely and longitudinally relative to said arcuate upper surface, and arcuate bottom wall means sealed in gas-tight relationship to said side wall means, said plenums further including diffusion element supporting means spaced upwardly from said header pipe on said side wall means;

generally horizontal diffusion elements supported by said support means, said elements having air diffusion pores extending therethrough, but being free of through-holes other than air diffusion pores;

retaining means engaging said diffusion elements about their peripheries for securing said elements to said plenums;

sealing means adjacent the peripheries of the diffusion elements for preventing leakage of air from said plenums past the peripheries of said elements; and

air flow regulator members in communication and connected with said air outlet openings and terminating beneath said diffusion elements for providing controlled flow of air from the interior of said header pipe to the interiors of said plenums beneath said diffusion elements.

4,288,395

DIFFUSION ELEMENT WITH BOUNDARY ZONE TREATMENT

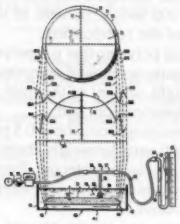
Lloyd Ewing, Bayside; David T. Redmon, Racine, and William H. Roche, Mequon, all of Wis., assignors to Water Pollution Control Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 952,862, Oct. 19, 1978. This application Apr. 15, 1980, Ser. No. 140,505

The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.

Int. Cl.[3] C02C *1/12*

U.S. Cl. 261—122 42 Claims



1. A diffusion element comprising

a peripheral zone which has lesser permeability, greater density or lesser height than a portion of the element surrounded by said peripheral zone;

a boundary zone, adjacent to and inward of the peripheral zone, characterized by a progressive increase in the apparent volumetric compression ratio of the element in a direction toward the peripheral zone, or toward a generally upright or vertical surface which is near the periphery of the element; and

a further portion, adjacent to and inward to said boundary zone;

said element being formed of a body of solid particles which has been shaped, pressed, and rendered coherent by bonding or sintering in a compacted form having pores;

said element including a generally horizontal portion having a specific permeability in the range of about 6 to about 200 SCFM per square foot of gas discharge surface per inch of thickness at a driving pressure of 2 inches in water gauge under standard conditions; and

said generally horizontal portion, when viewed in vertical cross-section, while positioned with its maximum dimension extending horizontally, having a maximum horizontal dimension in a ratio of at least about 4 to 1 relative to the thickness of said generally horizontal portion and including an upper gas discharge surface which is generally horizontal and which has a bubble release pressure in water in the range of about 2 to about 20 inches in water gauge.

4,288,396

METHOD AND DEVICE FOR CONDITIONING OF BREATHING AIR FOR DIVERS

Nils T. Ottestad, Hilton 156 A, N-2040 Klofta, Norway

Continuation of Ser. No. 961,826, Nov. 17, 1978, abandoned. This application Jan. 29, 1980, Ser. No. 116,414

Int. Cl.[3] B01F *3/04*

U.S. Cl. 261—128 5 Claims

1. A method of conditioning the breathing air for an underwater diver, comprising: the steps of drawing dry, cold air from a source of pressurized air located underwater and being connected to a conditioning apparatus located underwater, in response to the breathing demand of the diver, heating said air in said apparatus to a temperature substantially higher than the body temperature of the diver; humidifying said heated air by supplying water thereto and passing it through a filter means having a large surface wherein said water is distributed over said surface for achieving efficient vaporization; and cooling the heated and humidified air to a temperature slightly above the body temperature of the diver and thereby increasing the relative humidity of said air to close to saturation, and supplying the so-conditioned air as breathing air directly to the lungs of the diver.

2. Apparatus for conditioning breathing air for an underwater diver, said apparatus being located underwater, comprising

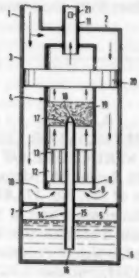
(a) a housing defining an air passage therethrough;

(b) an inlet tube coupled to one end of said air passage for connection to a supply of pressurized, dry, cold air;

(c) a heating element for heating the dry, cold air arriving at and passing said air passage;

(d) a container located adjacent to said air passage for holding a supply of water;

(e) means for controllably supplying humidifying water from said container to the heated air;



said means comprising a metal filter gauze having a large surface for effecting distribution and efficient vaporization of water supplied thereto together with said heated air;

(f) an outlet tube coupled to another end of said air passage for connection to means including a breathing valve control for supplying air conditioned by the apparatus to the driver; and

(g) temperature sensing means within the apparatus and at said breathing valve control arranged to control means for regulating the temperature of the breathing air so that the conditioned breathing air has a temperature slightly above the body temperature of the diver and a relative humidity close to saturation.

4,288,397

SPINNING PROCESS AND APPARATUS

Paul Snowden, Redcar, and Margaret L. Steel, Runcorn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 9, 1980, Ser. No. 138,546

Claims priority, application United Kingdom, Apr. 9, 1979, 12359/79; Mar. 3, 1980, 07084/80

Int. Cl.[3] B29C *6/00*

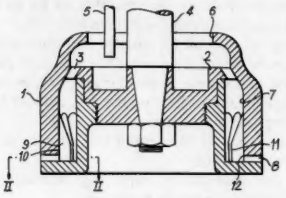
U.S. Cl. 264—8 6 Claims

1. A process for the centrifugal spinning of fibers, utilizing a centrifugal spinning cup comprising a hollow cylinder with a plurality of discrete passages positioned around and extending through its circumferential wall from the interior cylindrical surface of the cup, with a plurality of flow-dividing members disposed between adjacent passage inlets and projecting inwardly from the interior cylindrical surface and axially extending for only a part of the length of the surface from the passages; said method comprising the steps of:

supplying a fibre-forming material in liquid form to the interior cylindrical surface at an area axially spaced from the passages so that the material must flow over a portion of the interior cylindrical surface before reaching the flow-dividing members;

dividing all of the fibre-forming material into a plurality of separate streams with the flow dividing members;

leading the fibre-forming material in each stream to the passage associated with that stream;



rapidly spinning the cup; and

collecting formed fibres from the passages.

4,288,398

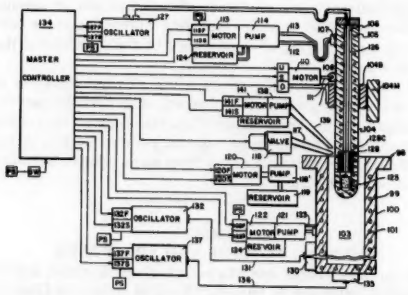
APPARATUS AND METHOD FOR CONTROLLING THE INTERNAL STRUCTURE OF MATTER

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 372,838, Jun. 22, 1973, abandoned, and a continuation-in-part of Ser. No. 53,834, Jul. 10, 1970, abandoned, and a continuation of Ser. No. 516,280, Dec. 27, 1965, abandoned, which is a continuation-in-part of Ser. No. 142,405, Oct. 2, 1961, Pat. No. 3,422,648, and Ser. No. 142,333, Oct. 2, 1961, abandoned. This application Mar. 3, 1976, Ser. No. 663,243

Int. Cl.[3] B29F *3/00*

U.S. Cl. 264—23 **5 Claims**



1. A method of forming an article to shape from thermal plastic resin in a molten condition and simultaneously improving the physical characteristics of such resin forming said article comprising:

causing a molten plastic resinous material to flow through an extrusion die, and

while said resinous material admitted to said die is in a plastic and formable condition, causing said plastic material to conform to the shape of said die, thereafter solidifying said plastic material flowed to said die to a predetermined shape, and

prior to the solidification of said plastic material, subjecting said material to ultrasonic vibrations of sufficient frequency and intensity such that the vibrational energy reacts on the material in a manner to substantially change and improve its crystalline structure over that structure of said material existing prior to rendering said material in said molten condition.

4,288,399

PROCESS FOR LOW PRESSURE MOLDING THERMOPLASTIC ELASTOMER COMPOSITIONS

Roy W. Siedenstrang, and William H. Cornell, both of Stow, Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 17, 1977, Ser. No. 825,175

Int. Cl.[3] B29C *3/00*

U.S. Cl. 264—25 **7 Claims**

1. A method for preparing molded articles comprising:

(a) introducing into a mold and enclosing in the mold the molding composition consisting essentially of:

(1) a thermoplastic elastomer that is a normally solid, linear or radial teleblock copolymer comprising about 30 to about 100 weight percent of the total polymeric component of the composition,

(2) solid resinous polymer that is a polymer of a vinyl-substituted aromatic compound comprising from about 0 to about 70 weight percent of the total polymeric component of the composition, and

(3) an amount ranging from about 0.5 to about 20 parts by weight per 100 parts by weight thermoplastic elastomer of a polarizing agent selected from among ethanolamines, isopropanolamines, and their hydrocarbyl-substituted derivatives;

(b) applying microwave energy to said composition for a time sufficient to produce a moldable consistency in said molded composition;

(c) supplying sufficient pressure up to about 200 psig to said molding composition for a time sufficient to produce a molded article;

(d) cooling said mold and molded article; and

(e) unmolding said cool molded article.

4,288,400

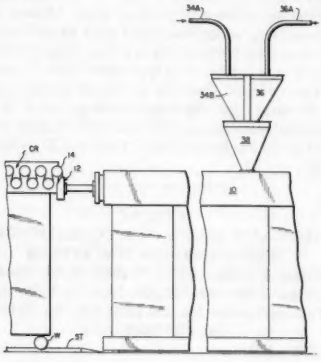
METHOD FOR THE CONTINUOUS FORMATION OF BIAXIALLY ORIENTED THERMOPLASTIC MATERIALS AND FORMING ARTICLES THEREFROM BY INTERMITTENT FORMING MEANS INTERFACED THEREWITH

Thomas W. Winstead, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Mar. 13, 1978, Ser. No. 886,161

Int. Cl.[3] B29D *7/04*

U.S. Cl. 264—210.1 **24 Claims**



1. The method of forming products of biaxially oriented thermoplastic material comprising:

continuously extruding a web of thermoplastic material;

biaxially stretching said web in a continuous manner to effect biaxial orientation therein and dimension said web for subsequent forming;

substantially immediately transferring said web into confor-

mal and dimensionally stable engagement with an undulating rotating peripheral surface to preclude loss of orientation;

transferring said web from said undulating surface onto a downstream transfer means while maintaining the dimensional integrity of said web;

synchronizing the transfer means with the undulations of said peripheral surface to intermittently advance lengths of the oriented web on said transfer means while continuously feeding the oriented web from said undulating surface; and

forming products in said intermittently advanced lengths of said oriented web, wherein the stress placed in the thermoplastic material by said biaxial orientation is substantially maintained from the initiation of said orientation to the forming of the products therein.

4,288,401

THERMOPLASTIC FORMING PROCESS

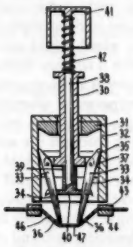
Donald G. Keith, Mount Eliza, and Anthony Flecknoe-Brown, Carlton, both of Australia, assignors to ICI Australia Limited, Victoria, Australia

Filed May 18, 1979, Ser. No. 40,312

Claims priority, application Australia, May 18, 1978, PD4433; Jun. 22, 1978, PD4833; Apr. 3, 1979, PD8263; Apr. 17, 1979, PD8398

Int. Cl.³ B29C *17/04*

U.S. Cl. 264—550 **4 Claims**



1. A method of stretch-forming a hollow article from a sheet of thermoplastic material at a temperature higher than 25° C. below the melting point and held against substantial non-stretching movement comprising pressing against one face of the sheet in a primary movement a plurality of tips carried symmetrically by a tool at a temperature lower than 50° C. below the melting point of the sheet and comprising a plunger having an axis extending in the direction of the primary movement, each tip being constituted by an end of a blade which blade is coplanar with the plunger axis and pivoted to the plunger, then while continuing the primary movement rotating the blades about the pivots while maintaining the blades coplanar with the plunger axis to symmetrically separate the tips in directions transverse of the plunger and to bring the outer edge of each blade from the tip progressively towards the rear into engagement with the sheet.

4,288,402

ACID FIELD TEST KIT FOR REFRIGERATION OILS CONTAINING A LEAK DETECTOR

Leonard C. Ellis, Chesapeake, Va., assignor to Virginia Chemicals Inc., Portsmouth, Va.

Filed Apr. 25, 1979, Ser. No. 33,240

Int. Cl.³ G01N *33/28*

U.S. Cl. 422—61 **29 Claims**

1. An acid field test kit for determining the acidity of oil samples, said test kit being of the two-phase type and operable within a single vial which has a selected internal volume, and said test kit being used: for measuring a sample of a refrigeration oil containing a highly colored leak detector; for carrying out a test procedure on said sample by fast phase separation into a solvent top layer and a highly ionic aqueous bottom layer; and for obtaining reliable test results as to acidity of said oil; and said test kit comprising:

A. at least one said vial having a means for indicating said selected internal volume;

B. a water-immiscible solvent, which is disposed within said vial; and

C. an indicator stock solution which is disposed within said vial, comprising:

(1) 20–28% by weight of a lower alcohol,

(2) 56–79% by weight of water,

(3) 6–12% by weight of a water-soluble inorganic salt,

(4) 0.2–0.3% by weight of a concentrated aqueous solution of a selected indicator having an unmistakable first color at a selected baseline pH which is at about the alkaline limit of the pH range for said indicator,

(5) sufficient alkaline hydroxide solution to create said baseline pH, and

(6) an amount of alkaline hydroxide solution which permits an unmistakable selected second color to appear within said aqueous bottom layer only when the acid number of said oil sample exceeds about 0.05 by limiting the change in pH from said baseline pH to a selected acidic pH at about the acid limit of said pH range after said oil sample has been mixed within said vial with said water-immiscible solvent and said indicator stock solution.

4,288,403

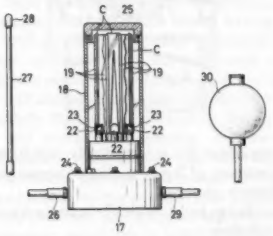
CHECKING PAPER FOR SHEET COMBUSTION TYPE OXYGEN CONCENTRATION MEASURING INSTRUMENT

Kogaku Komamiya, 438-7 Shimoishihara, Chofu, 182 Tokyo, and Hajime Suzuki, 3-61 Shioiri-cho, Yokosuka-shi, Kanagawa-ken, both of Japan

Continuation of Ser. No. 35,016, May 1, 1979, abandoned. This application Sep. 2, 1980, Ser. No. 182,861

Int. Cl.³ G01N *7/00, 31/12*

U.S. Cl. 422—83 **1 Claim**



1. An instrument for measuring oxygen concentration by sheet combustion of a sheet of checking paper in a desired location, comprising in combination:

(a) a stand (**17**) with an outer portion, a suction port (**26**) with an intake pipe (**27**) connected thereto on one side thereof and a discharge port (**29**) on the other side thereof, a cap (**28**) for sealing said intake pipe suction port (**26**) when desired and a removable bulb (**30**) and a connecting pipe for mounting on said discharge port (**29**);

(b) a transparent tall sealed container (**18**) mounted on said stand (**17**);

(c) upright parallel guide rails (**19**) erected at a plurality of positions on said stand within said container (**18**) so disposed as to define centrally thereof a desiccant compartment (**21**) and a desiccant (**20**) packed therein;

(d) nichrome wire holder means (**22**) at the bottom of each of said guide rails for supporting a nichrome wire (**23**), and

electrical switch means (24) on said stand outer portion for each of said holder means (22);

(e) paper holding means and checking paper bonded to said paper holding means, said paper holding means being a plate member sized and shaped for being held in said guide rails (19) and being provided with a cutout extending from one end of the plate member substantially to but not quite to the other end thereof and disposed so that said paper sheet has a partly exposed area (11) through said cutout in the holding means, said cutout having a general triangular shape with a wide portion towards the stand (17) and a narrow portion towards the top of said upright guide rails (19), said wide portion having an open end, said paper extending out beyond the open end of said holding means, said holding means having the corners of the open end so cut as to enlarge the opening thereat, said holding means and checking paper being so disposed in said rails (19) that the checking paper is brought into contact with the corresponding nichrome wire (23) so that the depression of said switch means (24) will heat up said nichrome wire and ignite said paper;

(f) a cover for said sealed container; and,

(g) a scale along said cutout to indicate oxygen content.

4,288,404

APPARATUS FOR AUTOMATICALLY STABILIZING A PROCESS OF THERMAL TREATMENT OF LIQUID MEDIA

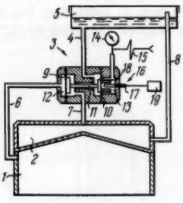
Jury V. Redikultsev, mikroraion "G", 19, kv. 113; Oleg P. Gorbunov, mikroraion "V", 28, kv. 18, and Alexandr M. Lomakin, mikroraion "G", 25, kv. 110, all of Puschino Moskovskoi oblasti, U.S.S.R.

Filed Dec. 20, 1979, Ser. No. 105,767

Claims priority, application U.S.S.R., Dec. 25, 1978, 2695900

Int. Cl.³ A61L *2/04, 2/24*

U.S. Cl. 422—107 **3 Claims**



1. An apparatus for automatically stabilizing a process of thermal treatment of liquid media, comprising:

a sterilization chamber;

a heat-exchange jacket which is in contact with said sterilization chamber;

a device for thermally controlling the process being conducted which is connected by means of individual pipelines to said sterilization chamber and to said heat-exchange jacket, said device comprising a coolant flow regulator which is divided by first and second flexible members into first, second and third sections, the first section comprising a pressure setting device in which an air pressure equal to the pressure of preselected conditions of the process being conducted is set-up, the second section comprising an overflow valve which is connected by means of said individual pipeline to said heat-exchange jacket and which cooperates with said pressure setting device through said first flexible member, and said third section comprising a pressure sensor which is connected by means of said individual pipeline to said sterilization chamber and cooperates with said overflow valve through the second flexible member; and

a source of a coolant which is connected by means of an individual pipeline to said overflow valve, the coolant from the source being admitted to said heat-exchange jacket through said overflow valve.

4,288,405

COAL HYDROGENATION APPARATUS HAVING MEANS FOR MONITORING AND CONTROLLING HYDROGENATION PRESSURE

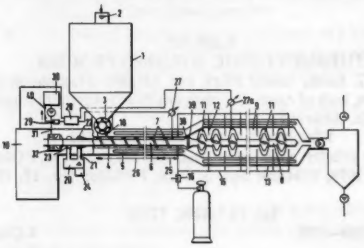
Klaus Koch, Laatzen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Fed. Rep. of Germany

Filed May 21, 1980, Ser. No. 151,763

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1979, 2948550

Int. Cl.³ B01J *3/03, 4/00, 8/10;* **C10G** *1/06*

U.S. Cl. 422—111 **1 Claim**



1. Apparatus for monitoring and controlling the hydrogenation pressure in a plant for hydrogenating coal with hydrogen to form hydrocarbons, which plant comprises a cylindrical preparation chamber with a friction element rotatable therein, and an adjoining, cylindrical hydrogenation chamber in communication with the preparation chamber by way of a feed aperture and containing a rotor with mixing vanes and static mixing nozzles projecting through the wall of the hydrogenation chamber for ejecting hydrogen, said monitoring and controlling apparatus comprising a shutoff valve between said preparation chamber and said hydrogenation chamber, said shut-off valve comprising a conical seat in said hydrogenation chamber adjacent said feed aperture and an adjacent portion of said rotor formed with a conical portion to cooperate with said conical seat, a hydraulic cylinder to axially displace said rotor and coupled to control means, pressure sensors connected to said control means and disposed in said hydrogenating chamber and in the end of said preparation chamber adjacent said hydrogenating chamber and a connection from said control means to a drive for said rotor, said control means being effective, when said pressure sensor in said preparation chamber senses a lower pressure there than that sensed by said pressure sensor in said hydrogenation chamber, to cause said hydraulic cylinder to move said rotor axially to close said shut-off valve and to cause said drive to stop rotation of said rotor.

4,288,406

PROCESS ENERGY RECOVERY

J. Robert Sims, Jr., Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

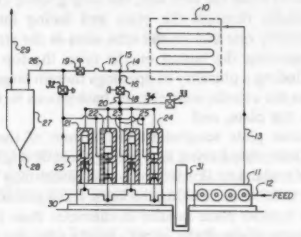
Filed Aug. 29, 1979, Ser. No. 70,566

Int. Cl.³ F01K *25/08;* **B01J** *3/00*

U.S. Cl. 422—131 **6 Claims**

1. A system for polymerizing ethylene and recovering energy from pressured reactor effluent comprising compressor means for compressing ethylene, reactor means for carrying out ethylene polymerization reactions under pressure and adapted to receive compressed ethylene from said compressor means, product recovery apparatus for separating reactor product effluent comprising polyethylene and unreacted ethylene, and a reciprocating engine comprising at least two cylinders, an inlet port and an outlet port in each cylinder, a first valve movably seated in each of said inlet ports, means biasing

said first valve into said inlet port, a piston slidably movable in each cylinder, each of said pistons having a conduit therethrough and a second valve movably mounted in each of said conduits, toward said first valve and aligned to contacts at first valve, each of said second valves being biased out of said



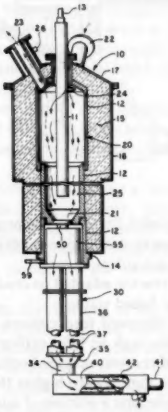
conduits, whereby contact of said first valve and said second valve forces said second valve into said conduit and forces said first valve out of said inlet port, said reciprocating engine adapted to receive reactor effluent under pressure and being operatively responsive to the expansion of reaction effluent therein.

4,288,407

METHOD AND APPARATUS FOR TREATING MATERIAL IN A FLUIDIZED BED

Richard F. Markel, Box 10327 Federal Station, Greenvil S.C. 29603, and W. M. Goldberger, 415 S. Parkview, Columbus, Ohio 43209

Division of Ser. No. 592,118, Jul. 1, 1975, abandoned. This application Jun. 8, 1978, Ser. No. 913,758
Int. Cl.³ B01J *8/42*
U.S. Cl. 422—143 **8 Claims**



1. An apparatus for treating carbonaceous particulate material comprising:

a heating chamber including receiving means for continuously receiving a quantity of fluidizable, carbonaceous particles from an upper portion thereof and particle discharge means disposed at a lower portion of said heating chamber for continuously discharging said carbonaceous particles, said heating chamber having interior wall surfaces which are formed of a carbonaceous material to serve as a first electrode;

a second electrode of elongate shape disposed within said heating chamber along a substantial length of the longitudinal axis of said interior wall surfaces comprising said first electrode and in contact with said received carbonaceous particles;

means for supplying electrical current to said electrodes; and

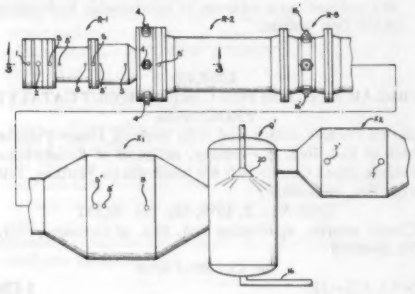
means for fluidizing said carbonaceous particles within said heating chamber to form a fluidized zone within said chamber, said fluidized zone coincidental with an electrothermal zone formed by the flow of electrical current between said interior wall surfaces comprising said first electrode and said second electrode by means of and through said carbonaceous particles.

4,288,408

APPARATUS FOR THE DIACRITIC CRACKING OF HYDROCARBON FEEDS FOR THE SELECTIVE PRODUCTION OF ETHYLENE AND SYNTHESIS GAS

Eugene D. Guth, Villa Park; LeGrand A. Daly, and John K. Arand, both of Rancho Palos Verdes, all of Calif., assignors to L. A. Daly Company, Rancho Palos Verdes, Calif.

Filed Jul. 7, 1978, Ser. No. 922,675
Int. Cl.³ B01J *7/00, 10/00*
U.S. Cl. 422—193 **21 Claims**



1. Apparatus for the diacritic cracking of hydrocarbon feedstocks to obtain high yields for ethylene comprising:

a combustor means, said combustor means having an inner combustor wall defining a generally cylindrical combustion chamber, an outer combustor wall, and a fuel and oxidizer injector plate disposed transversely to said inner combustor wall and adjacent to the inlet of said combustor means for axially injecting a hyrocarbon fuel and an oxidizer into said combustion chamber to create a flow stream substantially without tangential flow components of high temperature gaseous combustion products, said combustion chamber having a length approximately three times its initial diameter, said diameter tapering to a diameter approximately two-thirds its initial diameter adjacent the combustor outlet, and said combustion chamber having a plurality of annular gas filming slots facing downstream parallel and adjacent to said inner combustor wall, for directing a non-reactive gas film along said inner combustor wall to prevent impingement of hydrocarbons upon said inner combustor wall;

feed stock injection means coupled to said combustor means, said injection means having a plurality of feed stock injectors disposed about the periphery of the flow stream, each of said feed stock injectors having an injector head, a feed stock supply line, and a means for providing a layer of non-reactive gas film flowing around said feed stock supply line and said injector head, for injecting a hydrocarbon feed stock in finely dispensed droplets into the flow stream received from the combustor means;

a reactor means coupled to said feed stock injection means for receiving the flow stream of hot combustion products and feed stock and defining a flow path of predetermined length within which cracking may take place, said reactor

means having an inner reactor wall defining a reactor chamber and an outer reactor wall, and having means for directing a non-reactive gas film along said inner reactor wall;

quench means coupled to said reactor means to receive the flow stream therefrom, said quench means having a plurality of quench fluid spray nozzles around the periphery of said inner reactor wall and having a means for providing a layer of non-reactive gas filming flowing around said spray nozzles, said spray nozzles being a means for spraying a quench fluid into the fluid stream to reduce the temperature thereof by an amount sufficient to terminate substantial cracking reactions;

a first heat exchanger coupled to said quench means for recovering heat from the flow stream from the quench means, said first heat exchanger being a tube and shell type of exchanger, said first heat changer having a plurality of water-jacketed cooling tubes, with each of said cooling tubes having means for directing non-reactive gas films along the inner walls thereof to discourage the impingement of the flow stream thereon; and

a knock out pot means coupled to said first heat exchanger for spraying a coolant into the flow stream coming from said first heat exchanger to reduce the stream temperature to condense out a majority of condensable hydrocarbons in the flow stream.

4,288,409

TUBULAR REACTOR FOR CARRYING OUT CATALYTIC PROCESSES

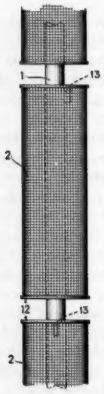
Heinrich Fedders, Jülich, and Willi Beckers, Übach-Palenberg, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Nov. 2, 1979, Ser. No. 90,532

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1978, 2848086

Int. Cl.³ B01J *8/06*

U.S. Cl. 422—219 **1 Claim**



1. A tubular reactor for containing solid catalyst configured in chunks of a certain minimum diameter, the reactor comprising:

a vertical tubular support with spaced keys projecting therefrom;

a plurality of wire mesh baskets for containing said chunks each of said baskets having a top and bottom and each enclosing an unobstructed circular area, said baskets being mounted vertically on the tubular support in spaced relation with respect to one another and being supported by one of said keys;

a top end plate for enclosing the top of each basket, said top end plate having a central opening conforming to the tube, at least one radially projecting slot extending into the plate from the central opening for allowing the key on the tube to pass through; at least one radially projecting stop groove extending into the plate and being angularly spaced from the first slot, the stop groove extending only partially through the plate and facing into the basket whereby one key on the tube rests in the stop groove for supporting the basket on the tube; the top plate further including a plurality of openings therein larger in diameter than the chunks whereby the baskets can be filled through the top plate, and

a bottom plate secured to the bottom of the basket, said bottom plate having an opening therethrough with at least one radial key slot whereby the basket may be slid down the tube while clearing the keys, and a plurality of holes in the bottom plate smaller in diameter than the chunks to thereby support the chunks while allowing fluid to flow through the bottom plate.

4,288,410

APPARATUS FOR PREPARING ALUMINUM ALKOXIDES

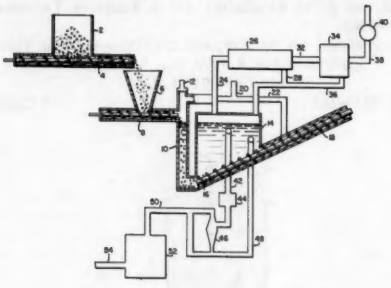
Willis W. Weber, South Salem; Richard F. Hill, Cold Spring, both of N.Y., and Thomas J. Weeks, Jr., Columbus, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 32,640, Apr. 23, 1979, Pat. No. 4,242,271.

This application Jul. 17, 1980, Ser. No. 169,757

Int. Cl.³ B01J *8/02*

U.S. Cl. 422—233 **1 Claim**



1. Apparatus suitable for use in the preparation of aluminum alkoxide by the reaction of a monohydric alcohol and impure aluminum which comprises

(a) an enclosed reactor adapted to contain a reactive mass of alcohol in the liquid state;

(b) a vertically disposed feed column communicating with said reactor through an inlet orifice located in the lower portion of said reactor, said feed column having an ingress opening to the atmosphere higher than the inlet orifice in said reactor whereby a portion of said feed column is filled with alcohol when said reactor is charged with alcohol to a point above the inlet orifice;

(c) means for depositing impure aluminum particles into the ingress opening of said feed column;

(d) a sludge removal column providing a conduit connecting the interior of the said reactor at a point below the surface of the liquid mass to be contained therein and the external atmosphere at a point having the same elevation as the surface of the said liquid mass in said reactor;

(e) means for transporting deposited impure aluminum particles from the inlet orifice of said reactor upwardly through said reactor in intimate contact with the liquid alcohol mass to be contained therein, and for conveying unreacted impurities associated with said aluminum parti-

cles out of said reactor through the said sludge removal column; and

(f) means for venting gases and vapors from the upper portion of the reactor.

4,288,411

PROCESS FOR THE SELECTIVE PRODUCTION OF A PLURALITY OF INDIVIDUAL PURE HALIDES AND/OR HALIDE MIXTURES FROM A MIXTURE OF SOLID OXIDES

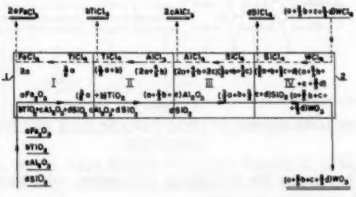
Gerhard Holland, and Rudolf Nowak, both of Westendstrasse 18a, D 6000 Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 3, 1979, Ser. No. 63,514

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834165

Int. Cl.³ C01B 9/00

U.S. Cl. 423—1 **17 Claims**



1. A process for the selective production of individual pure halides and/or mixtures of halides from a mixture of solid oxides, either without or with only one single reducing halogenation stage using the known series of halide-forming affinities, characterised by the following features:

(a) the comminuted mixture of solid oxides is loaded into the front end of a unit having as many zones as the number of halides or halide mixtures to be produced, and is passed through it;

(b) into the rear end of the unit is fed a halide of an element with a lower halide-forming affinity than that of the lowest halide-forming affinity of those to be produced, whereby the quantity of halide supplied is equivalent to the total halogen content of the halides to be extracted from the units;

(c) the halide fed into the rear end of the unit and the solid oxide or mixture of oxides arriving there are converted by oxygen-halogen exchange to a solid oxide and a gaseous halide or mixture of halides;

(d) the solid oxide formed in the rear end of the unit is separated from the halide or mixture of halides and is removed from the unit;

(e) the gaseous halide or mixture of halides formed in the rear end of the unit is brought in contact in counter-current flow with the solid oxide mixture further to the front of the unit whereby again through an oxygen-halogen exchange an individual gaseous halide or mixture of halides is formed in each zone of the unit; and

(f) fractions of the gaseous halides or mixtures of halides formed in the individual zones are separated from the solid oxides and extracted from the unit in quantities such that the extracted amount of halide of each element is equivalent to the amount of oxide mixture loaded into the front end of the unit.

4,288,412

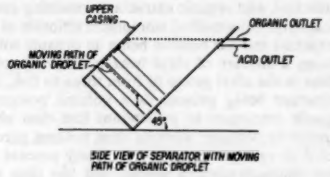
POST TREATMENT METHOD FOR THE RECOVERY OF URANIUM FROM WET-PROCESS PHOSPHORIC ACID

Sir-Sen Chang, Taipei; Sheng-Laang Chern, Taoyuan; Gann Ting, and Tsai-Shu Kuo, both of Taipei, all of Taiwan, assignors to Institute of Nuclear Energy Research, Taiwan, Taiwan

Filed Aug. 31, 1978, Ser. No. 938,658

Int. Cl.³ C01G 43/00

U.S. Cl. 423—10 **5 Claims**



SIDE VIEW OF SEPARATOR WITH MOVING PATH OF ORGANIC DROPLET

1. A method of effectively separating residual organic solvent entrained in the phosphoric acid raffinate obtained from uranium extraction comprising:

passing the raffinate into an inclined tank having parallel lower and upper casings, the tank containing a plurality of plates attached essentially perpendicularly to the lower casing but not touching the upper casing, whereby droplets of said organic solvent separate from the raffinate, flow upward along the lower surface of the plates, continue to flow upward along the inner surface of the upper casing and accumulate as a separate layer on the surface of the raffinate in the tank, the rate of flow of the raffinate into the tank being insufficient to cause said droplets of organic solvent to be carried away in the raffinate flow; and

separately withdrawing the layer of organic solvent and the raffinate from the tank.

4,288,413

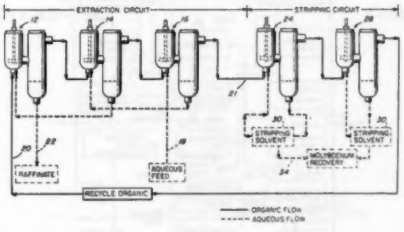
SEPARATING MOLYBDENUM VALUES FROM AN AQUEOUS SOLUTION CONTAINING TUNGSTEN BY SOLVENT EXTRACTION

Martin B. MacInnis, and Tai K. Kim, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 38,969, May 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 952,425, Oct. 18, 1978, abandoned. This application Jun. 12, 1980, Ser. No. 158,967

Int. Cl.³ C01G 41/00

U.S. Cl. 423—54 **1 Claim**



1. A process for separating molybdenum values from an aqueous solution containing molybdenum and tungsten values comprising the following steps:

(a) forming an aqueous solution comprising less than about five grams per liter sodium molybdate and from about fifty to about two hundred grams per liter sodium tungstate;

(b) sulfidizing said aqueous solution to form a sulfidized

solution, said sulfidizing being carried out to an extent sufficient to convert substantially all of the sodium molybdate to sodium thiomolybdenum species, said sulfidizing being substantially less than the extent necessary to convert substantially all of said sodium tungstate to sodium thiotungsten species;

(c) contacting said sulfidized aqueous solution at a pH of from about eight to about nine and one-half with a suitable amount of organic extractant for a sufficient period of time to preferentially extract greater than ninety percent of the sodium thiomolybdenum species into the organic extractant, said organic extractant consisting essentially of tricaprylyl monomethyl ammonium chloride as the active extractant and the balance being an organic solvent comprising a mixture of alkyl benzenes having total carbon atoms in the alkyl group of from three to five, said active extractant being present as a volume percent of total organic extractant in an amount less than about three percent by volume wherein said volume percent is selected to result in greater than ninety percent of the sodium thiomolybdenum species and less than about five percent of the sodium thiotungsten species present in said solution being extracted,

(d) separating the organic extractant containing the sodium thiomolybdenum species from the sulfidized aqueous solution containing sodium thiotungsten values,

(e) stripping molybdenum values from the separated organic extractant by contacting said organic extractant with an aqueous solution containing sufficient amount of oxidizing agent suitable for oxidizing said molybdenum values to molybdate ion, and

(f) recycling said extracted solution to step (c) to extract further molybdenum values.

4,288,414

PROCESS FOR CHLORINATING CLAYS AND BAUXITE

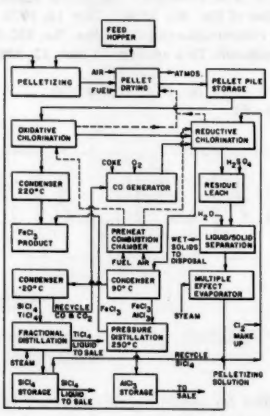
James E. Reynolds, Golden, and Alan R. Williams, Denver, both of Colo., assignors to Public Service Company of New Mexico, Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 873,400, Jan. 30, 1978, Pat. No. 4,159,310. This application Jun. 20, 1979, Ser. No. 50,549

The portion of the term of this patent subsequent to Jun. 26, 1996, has been disclaimed.

Int. Cl.³ C01G *23/02;* C01F *7/56;* C01G *49/10;* C01B *33/08*

U.S. Cl. 423—79 **15 Claims**



1. A process for recovering aluminum from material selected from the group consisting of clays associated with coal and bauxite wherein the material contains aluminum, iron and siliceous materials comprising:

(a) chlorinating the material in an oxidizing atmosphere containing oxygen in an amount of from about 20 to about 60 percent by volume of the total gas composition at a temperature of about 650° C.–900° C. to selectively vaporize iron as iron chloride;

(b) chlorinating the residue of step (a) in a reducing atmosphere at a temperature of about 600° C.–850° C. to vaporize the chlorides of aluminum and silicon; and

(c) separating and recovering the formed chlorides from the vapors by selective condensing.

4,288,415

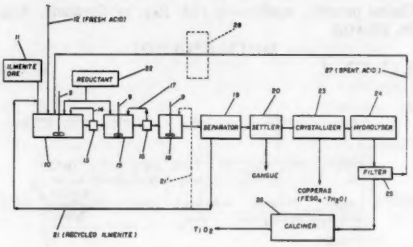
PROCESS FOR MANUFACTURING TITANIUM COMPOUNDS USING A REDUCING AGENT

Joseph A. Rahm, Long Branch, N.J., and Donald G. Cole, Pulheim, Fed. Rep. of Germany, assignors to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 65,449, Aug. 10, 1979, abandoned. This application May 30, 1980, Ser. No. 151,998

Int. Cl.³ C01G *23/053, 23/00*

U.S. Cl. 423—82 **14 Claims**



1. A process for producing a titanium sulphate solution which comprises reacting

(a) a titaniferous bearing material in an amount between about 10% and about 400% above the stoichiometric amount of titaniferous bearing material necessary to react with sulfuric acid to provide titanium sulphate, and

(b) a dilute sulfuric acid solution having a concentration between about 25% and about 60% by weight, based upon the total weight of said solution,

at a temperature below about 140° C., in the presence of a reducing agent which effects the reduction of ferric iron to ferrous iron; cooling the resulting reaction mixture to a temperature below 110° C. without precipitating the reaction products to produce a reaction mixture containing titanium sulfate; and separating undissolved solids to produce a titanium sulfate solution.

4,288,416

PROCESS FOR MANUFACTURING TITANIUM COMPOUNDS

Brian R. Davis, Bricktown, and Joseph A. Rahm, Long Branch, both of N.J., assignors to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 65,450, Aug. 10, 1979, abandoned. This application May 30, 1980, Ser. No. 151,999

Int. Cl.³ C01G *23/053, 23/00*

U.S. Cl. 423—82 **16 Claims**

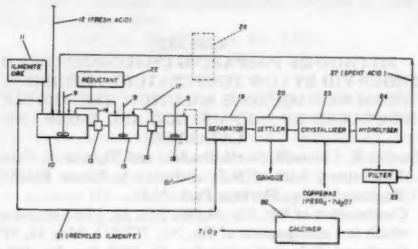
1. A process for producing a titanium sulphate solution, which comprises: reacting

(a) a titaniferous bearing material in an amount between about 10% and about 400% above the stoichiometric amount of titaniferous bearing material necessary to react with sulfuric acid to provide titanium sulphate, and

(b) a dilute sulfuric acid solution having a concentration between about 25% and about 60% by weight, based upon the total weight of said solution,

at a temperature below about 140° C. in the absence of a reducing agent; cooling the resulting reaction mixture to a tempera-

ture below about 110° C. without precipitating the reaction products to produce a reaction mixture containing titanium



sulfate, and separating undissolved solids to produce a titanium sulfate solution.

4,288,417

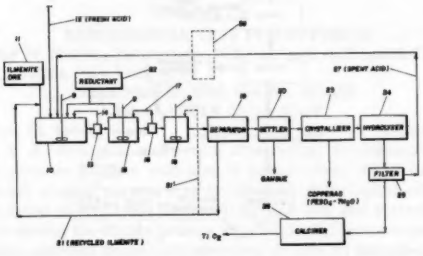
PROCESS FOR MANUFACTURING TITANIUM DIOXIDE

Joseph A. Rahm, Long Branch, N.J., and Donald G. Cole, Pulheim, Fed. Rep. of Germany, assignors to NL Industries, Inc., New York, N.Y.

Continuation of Ser. No. 65,449, Aug. 10, 1979, abandoned. This application Oct. 29, 1980, Ser. No. 201,938

Int. Cl.³ C01G *23/053*

U.S. Cl. 423—83 **14 Claims**



1. A process for producing titanium dioxide pigment which comprises (1) reacting

ilmenite, in an amount between 10% and 400% in excess of the stoichiometric amount of ilmenite necessary to react with sulfuric acid to provide titanyl sulphate, and

dilute sulfuric acid solution having a concentration between about 25% and about 60% by weight, based upon the total weight of said solution,

at a temperature below about 140° C. in the presence of a reducing agent which effects the reduction of ferric iron to ferrous iron; (2) cooling the resulting reaction solution to a temperature below about 100° C.; (3) removing iron sulphate from said reaction solution to provide a titanyl sulphate solution; (4) hydrolyzing said titanyl sulphate solution to provide a hydrate of titanium dioxide; (5) calcining said hydrate of titanium dioxide to provide titanium dioxide, and (6) recovering titanium dioxide.

4,288,418

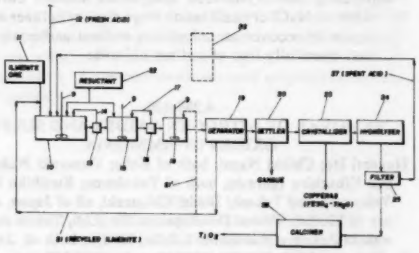
PROCESS FOR MANUFACTURING TITANIUM DIOXIDE

Brian R. Davis, Bricktown, and Joseph A. Rahm, Long Branch, both of N.J., assignors to NL Industries, Inc., New York, N.Y.

Continuation of Ser. No. 65,450, Aug. 10, 1979, abandoned. This application Oct. 29, 1980, Ser. No. 202,039

Int. Cl.³ C01G *23/053*

U.S. Cl. 423—83 **12 Claims**



1. A process for producing titanium dioxide pigment which comprises

(1) reacting

ilmenite, in an amount between 10% and 400% in excess of the stoichiometric amount of ilmenite necessary to react with sulfuric acid to provide titanyl sulphate, and

dilute sulfuric acid solution having a concentration between about 25% and about 60% by weight, based upon the total weight of said solution,

at a temperature below about 140° C.; (2) cooling the resulting reaction solution to a temperature below about 100° C.; (3) removing iron sulphate from said reaction solution to provide a titanyl sulphate solution; (4) hydrolyzing said titanyl sulphate solution to provide a hydrate of titanium dioxide; (5) calcining said hydrate of titanium dioxide to provide titanium dioxide and (6) recovering titanium dioxide.

4,288,419

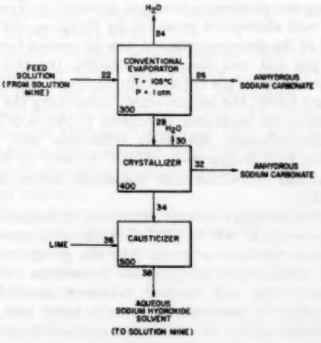
ENHANCED RECOVERY OF SODIUM CARBONATE FROM NaCL-CONTAINING SODIUM CARBONATE SOLUTIONS

William C. Copenhafer, Yardley, Pa., and Francis Rauh, Plainsboro, N.J., assignors to Intermountain Research & Develop. Corp., Green River, Wyo.

Filed Apr. 4, 1980, Ser. No. 137,209

Int. Cl.³ C01D *7/07, 7/26;* E21B *43/28*

U.S. Cl. 423—190 **9 Claims**



1. A method for enhancing recovery of sodium carbonate

values from an NaCl-containing aqueous sodium carbonate solution, which comprises

subjecting an aqueous sodium carbonate solution which contains at least about 10% by weight sodium chloride to evaporative crystallization at superatmospheric pressure and at a temperature of at least 120° C. to induce crystallization of anhydrous sodium carbonate crystals without co-crystallization of sodium chloride until a crystallizer mother liquor containing less than 9% by weight Na_2CO_3 and greater than 23% by weight NaCl is obtained; and

separating the crystallized anhydrous sodium carbonate without NaCl crystallization from the crystallizer mother liquor to recover an anhydrous sodium carbonate product, essentially free of sodium chloride.

4,288,420

REMOVAL OF NITROGEN OXIDES AND SULFUR OXIDES BY AMMONIA

Hayami Ito; Chiaki Nagai, both of Kobe; Yasuyuki Nakabayashi; Kihachiro Igarashi, both of Yokohama; Kunihiko Mouri, Yokosuka, and Takashi Ikeda, Chigasaki, all of Japan, assignors to Electric Power Development Co. Ltd., Tokyo and Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, both of, Japan

Filed Aug. 29, 1980, Ser. No. 183,565
Claims priority, application Japan, Sep. 3, 1979, 54-113430
Int. Cl.³ B01D *53/36*
U.S. Cl. 423—239 **2 Claims**

1. In a process for removing nitrogen oxides from sulfur oxides and ash containing exhaust gases from a coal-fired boiler by catalytic reduction followed by removal of the ash and ammonium-sulfur compounds from the gas, the improvement comprising contacting the ash containing ammonium-sulfur compounds with exhaust gas from said boiler at a temperature of 350° to 700° C. whereby the ammonium-sulfur compounds are decomposed, the sulfur compounds are preferentially retained in the ash and the ammonia containing exhaust gas is passed to said catalytic reduction.

4,288,421

PROCESS OF TREATING EXHAUST GAS CONTAINING NITROGEN OXIDES AND SULFUR DIOXIDE

Yoshihiko Kudo, and Hiroshi Hagiwara, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1979, Ser. No. 57,815
Claims priority, application Japan, Jul. 28, 1978, 53/92222
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—395 **5 Claims**

1. In a process for treating an exhaust gas containing nitrogen oxides and sulfur dioxide, wherein said exhaust gas is brought into contact with an aqueous absorbing solution containing at least an iron chelate salt and an alkali sulfite for the production of absorption products, said absorbing solution containing said absorption products is cooled to crystallize and separate said absorption products by filtration, the filtrate is recycled to the above-mentioned step of contact between said exhaust gas and said absorbing solution, the thus obtained absorption products are reduced into ammonia or nitrogen and elementary sulfur, the improvement comprising the steps of:

(a) heating the separated absorption products of potassium imidodisulfonate, potassium dithionate and potassium sulfate to a temperature of 250° to 400° C. to convert potassium dithionate into potassium sulfate and sulfur dioxide;

(b) further heating a residual potassium imidodisulfonate to a temperature of 800° to 1000° C. in the presence of a carbonaceous substance selected from the group consisting of coal, coke, petroleum pitch and petroleum coke thereby decomposing said residual potassium imidodisulfonate into gaseous ammonia and at the same time reducing potassium sulfate into potassium polysulfide; and

(c) heating potassium polysulfide in the presence of carbon dioxide and steam to a temperature of 350° to 500° C., preferably 380° to 450° C. thereby converting said potassium polysulfide into hydrogen sulfide, gaseous sulfur and potassium carbonate.

4,288,422

METHOD OF PREPARING CHALCOGENIDES OF GROUP VIII BY LOW TEMPERATURE PRECIPITATION FROM MONAQUEOUS SOLUTION, THE PRODUCTS PRODUCED BY SAID METHOD AND THEIR USE AS CATALYSTS

Russell R. Chianelli, North Branch, and Theresa A. Pecoraro, Middletown, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 14,589, Feb. 23, 1979, abandoned, which is a continuation of Ser. No. 797,011, May 16, 1977, abandoned. This application Jun. 16, 1980, Ser. No. 160,106
Int. Cl.³ C01B *19/04;* **C01G** *3/12, 55/00*
U.S. Cl. 423—509 **15 Claims**

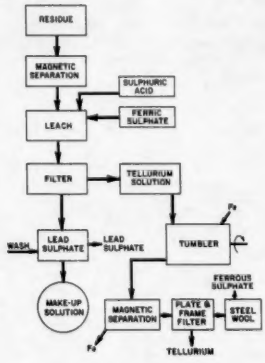
1. Chalcogenides amorphous to x-ray, having a particle size of less than 0.1 micron and a crystallite size of about 50 A × 100 A or less of the formula MX_y wherein M is a metal selected from the group consisting of ruthenium, rhodium, iridium and osmium, X is a chalcogen selected from the group consisting of sulfur, selenium, tellurium and mixtures thereof, and y is a number ranging from about 0.1 to about 3.

4,288,423

METHOD OF RECOVERING METALLIC TELLURIUM

Hans W. Rasmussen, St. George, Utah, assignor to Clarence E. Hulbert, Jr. and O. W. Coburn, both of Muskogee, Okla.

Filed Jul. 11, 1980, Ser. No. 168,759
Int. Cl.³ C01B *19/02;* **C01G** *21/20*
U.S. Cl. 423—510 **6 Claims**



1. A method of recovering metallic tellurium from a residue dust containing a major amount of lead oxide, a minor amount of tellurium oxide and a minor amount of iron oxide which comprises introducing the residue into a leach tank containing water, sulphuric acid and ferric sulphate, reacting the residue with the sulphuric acid and the ferric sulphate in the leach tank to produce lead sulphate and a tellurium solution, removing the lead sulphate and tellurium solution from the leach tank and separating the lead sulphate from the tellurium solution, adding the separated tellurium solution to a tumbler containing particles of metallic iron, agitating the tumbler so that the tellurium solution reacts with the iron to produce ferrous sulphate and metallic tellurium, withdrawing the mixture of ferrous sulphate and metallic tellurium from the tumbler and separating out the ferrous sulphate to recover essentially pure metallic tellurium.

4,288,424

GENERATOR FOR IONIC GALLIUM-68 BASED ON COLUMN CHROMATOGRAPHY

Rudi D. Neirinckx, Medfield, and Michael A. Davis, Westwood, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 15, 1979, Ser. No. 3,552
Int. Cl.³ A61K *43/00*; B65D *71/00*
U.S. Cl. 424—1 5 Claims

1. The process for obtaining a physiologically acceptable aqueous solution of gallium-68 which comprises binding $^{68}GeF_6=$ to an anion-exchange resin from a hydrofluoric acid solution whereby gallium-68 fluorides are formed in situ from said $^{68}GeF_6=$, eluting said gallium-68 fluorides from said resin with an aqueous HF solution and neutralizing the aqueous HF solution containing gallium-68 fluorides.

4,288,425

METHOD AND APPARATUSES FOR ELECTROPHORETIC IMMUNOASSAY

Martin J. Lee, Leonia, N.J., and Leonard Ornstein, White Plains, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jan. 31, 1979, Ser. No. 8,203
Int. Cl.³ G01N *33/48*
U.S. Cl. 424—1 10 Claims

1. A disc-electrophoretic method for analyzing a sample constituent, said constituent having an ionic charge, said method comprising the steps of:

(a) introducing said sample constituent into a porous medium;

(b) applying an electric field across said medium for causing said constituent to migrate within said medium and concentrate by steady-state stacking in a first position thereof;

(c) further migrating said stacked concentrated constituent through a second portion of said medium containing a reactant, so as to cause a reaction therewith; and

(d) measuring said reaction.

4,288,426

SEROLOGICAL TEST FOR SYPHILIS

Roy W. Stevens, Schenectedy, N.Y., assignor to Research Corporation, New York, N.Y.

Filed Mar. 20, 1980, Ser. No. 132,180
Int. Cl.³ G01N *33/54, 33/56*
U.S. Cl. 424—1 8 Claims

1. A serological method for determining the presence of *Treponema pallidum* antibodies in human serum which comprises diluting the serum to be tested in physiological saline solution to a dilution of from 1:20 to 1:100, and thereafter incubating the diluted serum with a lysate of *Treponema pallidum* adsorbed on an inert adsorbent to form an antigen-antibody conjugate when said antibodies are present, and detecting the presence of said conjugate.

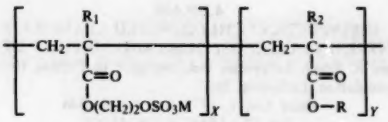
4,288,427

CONDITIONING SHAMPOO COMPOSITION AND INGREDIENT THEREFOR

Robert F. Farmer, III, Rockville, Md., and Phillip E. Sokol, deceased, late of Rockville, Md. (by Eunice Sokol, legal representative), assignors to The Gillette Company, Boston, Mass.

Filed Aug. 21, 1979, Ser. No. 68,369
Int. Cl.³ A61K *7/06*
U.S. Cl. 424—70 8 Claims

1. A shampoo composition comprising an aqueous solution containing 1 to 10% by weight of a compound having the formula



In which the molar ratio of X to Y is from 3:1 to 1:2, in which R is a straight or branched chain alkyl group having 4–18 carbon atoms, in which R_1 is $—CH_3$ when R_2 is —H, in which R_1 is —H when R_2 is $—CH_3$, in which the ratio of carbon atoms to $—OSO_3M$ groups is from 1:8 to 1:16, and in which M is sodium, potassium or triethanolamine, in combination with 5–25% by weight of a surface active agent selected from the class consisting of anionic, nonionic, and ampholytic surface active agents.

4,288,428

UDDER DISINFECTANT AND METHOD OF DISINFECTING TEATS

Ake L. Föll, Södertälje, and Stig G. Widell, Ödeshög, both of Sweden, assignors to Ewos Aktiebolaget, Södertälje, Sweden

Filed Mar. 27, 1980, Ser. No. 134,425
Claims priority, application Sweden, Apr. 2, 1979, 7902893
Int. Cl.³ A61K *31/74, 31/18*
U.S. Cl. 424—78 17 Clai-

1. An iodophorous udder disinfectant comprising an iodophor in the form of an alkylphenoxypoly(ethyleneoxy) ethanol-iodine complex or a polyvinylpyrrolidone-iodine complex, characterized in that in use dilution the disinfectant contains the iodophor complex in an amount sufficient to provide at least 0.01% by weight free iodine, 5 to 10% by weight urea, an acid in an amount sufficient to provide a pH between 1 and 5 and a solvent sufficient to make 100% by weight.

4,288,429

ANTIBIOTIC PLANOTHIOCINS

Tadashiro Fujii, Mishima; Satoshi Yaginuma, Shizuoka; Naoki Muto, Shizuoka, and Mitsuo Hayashi, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Aug. 5, 1980, Ser. No. 175,677
Claims priority, application Japan, Sep. 8, 1979, 54-101548; Dec. 5, 1980, 55-63264
Int. Cl.³ A61K *35/00*
U.S. Cl. 424—117 7 Claims

1. Planothiocin-A of the following properties:

(1) Melting point: 266°–269° C. (decomp.)

(2) Elementary analysis: C=49.47%, H=3.53%, N=13.25%, S=13.73%,

(3) Molecular weight: 1438 (minimum molecular weight calculated by amino acid analysis as one molecule of threonine in one molecule of the compound),

(4) Optical rotation: $[\alpha]_D^{23} = +19.6$ (c=0.7, pyridine)

(5) Ultraviolet absorption spectrum: FIG. 1 (in methanol), FIG. 2 (in acidic methanol), FIG. 3 (in alkaline methanol),

(6) Infrared absorption spectrum: FIG. 4,

(7) Color reaction:
positive: decoloring potassium permanganate, iodine,
negative: ferric chloride, ninhydrine, Molisch,

(8) Solubility:
soluble: mixture of $CHCl_3$-methanol, pyridine, DMSO, glacial acetic acid.
insoluble: benzene, acetone, petroleum ether, hexane,

(9) Nature: weakly acidic,

(10) Color: white crystals.

4,288,430

DISINFECTANT CHLORINATED CYANURATE CONTAINING COMPOSITIONS AND METHOD OF USE

James E. Etzel, Lafayette, Ind., assignor to Purdue Research Foundation, Lafayette, Ind.

Filed Aug. 6, 1979, Ser. No. 64,346
Int. Cl.³ A01N *59/08, 43/64*
U.S. Cl. 424—153 **2 Claims**

1. A method of disinfecting sodium chloride brine solutions held in a brine storage tank which is in fluid connection with an ion exchange column containing ion exchange resins for water softening, said brine being used to regenerate said ion exchange resins and the disinfecting of said brine thereby avoiding bacterial contamination of said resins, comprising adding to water in said brine storage tank a pelletized mixture of sodium chloride and a bactericidally effective amount of a chlorinated cyanurate selected from the group consisting of potassium dichloroisocyanurate and sodium dichloroisocyanurate, and dissolving said pelletized mixture in said water to provide both the chlorinated cyanurate to avoid bacterial contamination of the brine and the sodium chloride to form the brine solution for regeneration of said ion exchange resins.

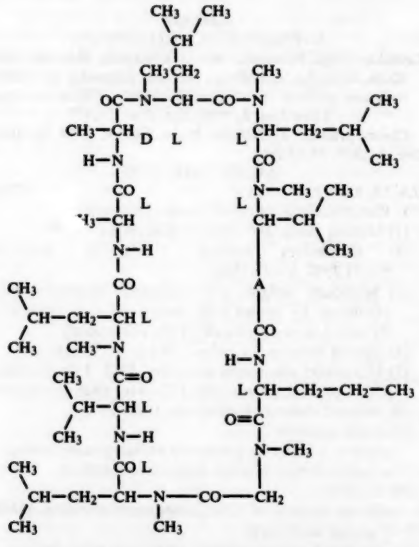
4,288,431

CYCLOSPORIN DERIVATIVES, THEIR PRODUCTION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

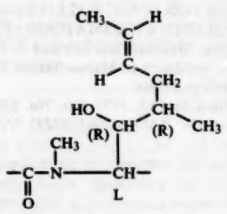
Rene P. Traber, Basel; Hans Hofmann, Ettingen; Eugen Härri, Therwil, and Kuhn Max, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Oct. 12, 1979, Ser. No. 84,100
Claims priority, application Switzerland, Oct. 18, 1978, 10776/78; Mar. 22, 1979, 2696/79; Aug. 15, 1979, 7480/79
Int. Cl.³ A61K *37/00;* C07C *103/52;* C12P *21/04*
U.S. Cl. 424—177 **9 Claims**

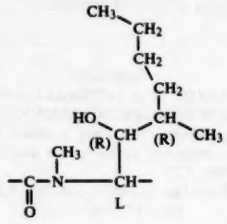
1. A compound of formula I



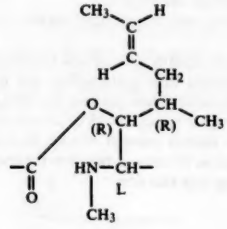
selected from the group consisting of cyclosporin G, wherein A is



dihydrocyclosporin G, wherein A is



and isocyclosporin G, wherein A is



4,288,432

NOVEL ENKEPHALIN ANALOGS AND PROCESS FOR THE PREPARATION THEREOF

Sandor Bajusz; Andras Ronay, and Jozsef Szekely, all of Budapest, Hungary, assignors to Richter Gedeon Vegyészeti Gyár Rt., Budapest, Hungary

Filed Jun. 6, 1980, Ser. No. 157,064
Claims priority, application Hungary, Jun. 12, 1979, G0 1448
Int. Cl.³ A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 **6 Claims**

1. An enkephalin analog having the formula I

$$H_2N\text{-}C(NH)\text{-Tyr-A-Gly-Phe-B} \quad (I)$$

wherein

Tyr, Gly and Phe are L-Tyrosine, glycine and L-phenylalanine residues, respectively,

A is a D-amino acid residue having a lower alkyl group of a lower thioalkyl group as a side chain, and

B is an amino group of an L-proline amide moiety, or a pharmaceutically acceptable salt thereof.

4,288,433
COSMETIC COMPOSITIONS HAVING A SLIMMING ACTION

Constantin Koulbanis, Paris; Claude Bouillon, Eaubonne, and Patrick Darmenton, Villejuif, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 849,128, Nov. 7, 1978, abandoned. This application Sep. 24, 1979, Ser. No. 78,513

Claims priority, application Luxembourg, Nov. 8, 1976, 76148

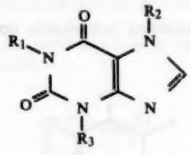
Int. Cl.³ A61K *31/625, 31/52, 31/22, 31/465*

U.S. Cl. 424—232 **6 Claims**

1. A method for the treatment of cellulitis which comprises massaging the part of the body to be treated with a therapeutically effective amount of a composition containing in a suitable vehicle:

(1) 0.1 to 1.5% by weight of a thioether selected from the group consisting of: S-carboxymethylcysteine, S-carboxymethylhomocysteine, thiolane-3,4-diol, thiolane-3,4-diol S-oxide, thiolane-3,4-diol S-dioxide and the malate, salicylate, nicotinate, tartrate or 5-amino-3-thiahexanedioate of 2-benzylthioethylamine, and

(2) 0.1 to 2% by weight of a xanthine derivative having the formula:



in which each of R_1 and R_3 independently represents a hydrogen atom, a linear or branched alkyl radical having 1 to 5 carbon atoms, an allyl radical, a propynyl radical or a cyclohexyl radical with the proviso that R_1 and R_3 do not simultaneously represent a hydrogen atom and R_2 represents hydrogen, a methyl, ethyl, hydroxymethyl or hydroxyethyl radical.

4,288,434
CEPHALOSPORANIC ACID DERIVATIVES

Rene Heymes, Romainville, France, assignor to Roussel Uclaf, Paris, France

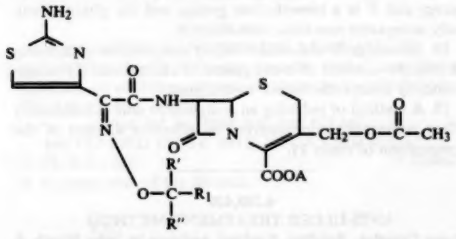
Filed Mar. 14, 1978, Ser. No. 886,421

Claims priority, application France, Mar. 25, 1977, 77 08988; Dec. 5, 1977, 77 36512

Int. Cl.³ A61K *31/545;* **C07D** *501/34*

U.S. Cl. 424—246 **24 Claims**

1. Syn isomers of a 7-amino-thiazolyl-acetamido-3-acetoxymethyl-cephalosporanic acid compound of the formula



wherein R_1 is selected from the group consisting of —CN, —$CONH_2$ and —$COOR_1'$, R_1' is selected from the group consisting of alkyl of 1 to 3 carbon atoms, hydrogen, alkali metal, alkaline earth metal, ammonium and a non-toxic, pharmaceutically acceptable organic amine, A is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, ammonium and a non-toxic, pharmaceutically acceptable organic amine, and when R_1' is other than alkyl, R_1' and A are the same, R' and R" are individually selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms with the

group in the syn position with the proviso that when R_1 is —$COOR_1'$ and R_1' is hydrogen, A is hydrogen and when R_1 is —$COOR_1'$ and R_1' is an alkali metal, alkaline earth metal, ammonium or a non-toxic, pharmaceutically acceptable organic amine, A has the same meaning as R_1'.

12. An antibacterial composition comprising an antibacterially effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

4,288,435
3,7-DISUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS AND PHARMACEUTICAL ANTIBACTERIAL COMPOSITIONS CONTAINING THEM

Takashi Kamiya, Suita; Kunihiko Tanaka, Toyonaka; Tsutomu Teraji, Osaka, and Yoshiharu Nakai, Ohtsu, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

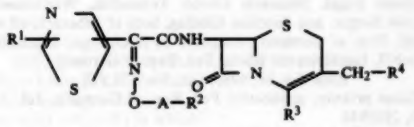
Filed Jul. 11, 1979, Ser. No. 56,504

Claims priority, application United Kingdom, Jul. 17, 1978, 30080/78

Int. Cl.³ A61K *31/545;* **C07D** *501/34, 501/56*

U.S. Cl. 424—246 **30 Claims**

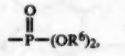
1. 3,7-Disubstituted-3-cephem-4-carboxylic acid compounds of the formula:



wherein

R^1 is ami... or an amino group protected by an eliminatable protective group;

R^2 is —CONH—R^5,



or —NHCO—R^7;

R^3 is carboxy or a carboxy group protected by an eliminatable protective group;

R^4 is C_1–C_6 alkanoyloxy, benzothiazolylthio, tetrazolylthio, or thiadiazolylthio, the latter two of which may have one C_1–C_6 alkyl;

R^5 is pyridyl, thiazolyl, or phenyl having one or more substituent(s) selected from halogen, hydroxy, carboxy and C_2–C_7 alkoxycarbonyl;

R^6 is hydrogen or C_1–C_6 alkyl;

R^7 is isoxazolyl disubstituted with C_1–C_6 alkyl and halogen substituted phenyl, or phenyl having one or more substituent(s) selected from hydroxy and halogen; and

A is C_1–C_6 alkylene; and

pharmaceutically acceptable salts thereof.

30. A pharmaceutical antibacterial composition comprising an effective amount of the compound of claim 1 in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,288,436

3,7-DISUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS

Takao Takaya, Kawanishi, and Masayoshi Murata, Mino, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

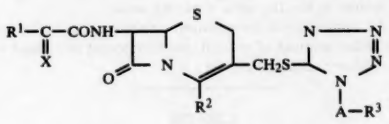
Continuation-in-part of Ser. No. 891,289, Mar. 29, 1978, abandoned. This application Sep. 28, 1979, Ser. No. 79,796

Claims priority, application United Kingdom, Apr. 13, 1977, 15378/77; Jan. 23, 1978, 2650/78

Int. Cl.[3] **A61K** *31/545;* **C07D** *501/56*

U.S. Cl. 424—246 **7 Claims**

1. 3,7-Disubstituted-3-cephem-4-carboxylic acid compounds of the formula:



wherein

R^1 is 2-amino-, lower alkanoylamino- or halo(lower)alkanoylamino substituted thiazol-4-yl;

R^2 and R^3 are each carboxy or an esterified carboxy;

X is lower alkynyloxyimino; and

A is lower alkylene, and pharmaceutically acceptable salt thereof.

7. A pharmaceutical antibacterial composition comprising a compound of claim **1** in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,288,437

2-[(AMINO)-ARYL-METHYLENE]-BENZO[b]THIOPHEN-3(2H)-ONES

Wolfhard Engel, Biberach; Günter Trummlitz, Warthausen; Ernst Seeger, and Joachim Kühling, both of Biberach, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

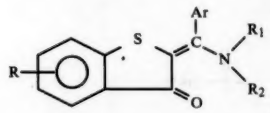
Filed Jul. 28, 1980, Ser. No. 173,173

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1979, 2931010

Int. Cl.[3] **A61K** *31/38, 31/44;* **C07D** *333/64, 409/06*

U.S. Cl. 424—246 **13 Claims**

1. A compound of the formula



wherein

Ar is phenyl; mono- or di-substituted phenyl, where the substituents are one to two halogens, one to two alkyls of 1 to 3 carbon atoms, or one amino, nitro, cyano or trifluoromethyl; or pyridinyl;

R is hydrogen, chlorine, methyl or methoxy;

R_1 is hydrogen or methyl;

R_2 is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, methyl-(cycloalkyl of 3 to 8 carbon atoms) or —A—R_4,

wherein

A is alkylene of 2 to 3 carbon atoms, and

R_4 is hydroxyl, methylamino, dimethylamino, N-methyl-ethylamino, diethylamino, pyrrolidino, piperidino, hexamethyleneimino, morpholino or 4-methyl-1-piperazinyl; or

R_1 and R_2, together with each other and the nitrogen atom to which they are attached, are pyrrolidino, piperidino, morpholino, N-methyl-piperazino, thiomorpholino, thiomorpholino-S-oxide or hexamethyleneimino.

13. The method of preventing or relieving convulsions in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective anticonvulsant amount of a compound of claim **1**.

4,288,438

NITROGEN-CONTAINING HETEROCYCLIC RING DERIVATIVES AND ANALGESIC AND ANTI-INFLAMMATORY COMPOSITIONS AND METHODS EMPLOYING THEM

Kazuo Kubo, Urawa; Noriki Ito, Iwatsuki; Isao Souzu, Urawa; Yasuo Isomura, Yokohama; Hiroshige Homma, Omiya, Japan, and Masuo Murakami, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

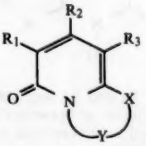
Division of Ser. No. 876,517, Feb. 9, 1978, Pat. No. 4,186,200, Continuation-in-part of Ser. No. 814,325, Jul. 11, 1977, abandoned. This application Aug. 20, 1979, Ser. No. 68,073

Claims priority, application Japan, Jul. 22, 1976, 51-87486; Dec. 29, 1976, 51-158228; Jan. 8, 1977, 52-464; Mar. 31, 1977, 52-36384; Apr. 13, 1977, 52-42423

Int. Cl.[3] **A61K** *31/505;* **C07D** *471/04*

U.S. Cl. 424—251 **15 Claims**

1. A nitrogen-containing heterocyclic compound of the formula



wherein one of R_1 and R_2 is a member selected from the group consisting of a lower alkyl group, a phenyl group, a halophenyl group, and a lower alkoxyphenyl group and the other of them is a member selected from the group consisting of a hydrogen atom, a lower alkyl group and a phenyl lower alkyl group; R_3 is a member selected from the group consisting of a hydrogen atom, a lower alkyl group, a phenyl group, and a phenyl lower alkyl group; X is an imino group, or an

wherein R_4' is a member selected from the group consisting of a lower alkyl group, a hydroxy lower alkyl group, a cycloalkyl group having 5–7 carbon atoms, and a phenyl lower alkyl group; and Y is a trimethylene group, and the pharmaceutically acceptable non-toxic salts thereof.

11. An analgesic anti-inflammatory composition comprising an effective amount of a compound of claim **1** and a pharmaceutically acceptable carrier or excipient.

15. A method of inducing an analgesic or anti-inflammatory effect comprising administering an effective amount of the composition of claim **11**.

4,288,439

ANTI-ULCER TREATMENT METHOD

Roger Crossley, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Filed Nov. 29, 1979, Ser. No. 98,418

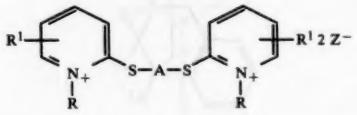
Claims priority, application United Kingdom, Nov. 30, 1978, 46724/78

Int. Cl.[3] **A61K** *31/44*

U.S. Cl. 424—263 **3 Claims**

1. A method for treating ulcers or hypersecretion in a mam-

mal which comprises orally administering to said mammal an effective amount of an anti-ulcer agent of formula I



wherein R is alkyl of 1 to 6 carbon atoms, or aralkyl of 7–12 carbon atoms, R^1 is hydrogen or alkyl of 1 to 6 carbon atoms, and the R and R^1 radicals may be the same or different, A is methylene or ethylene radical, optionally substituted by lower alkyl of 1 to 6 carbon atoms, oxo, or hydroxy, S is sulphur and Z^- is a halide or lower alkyl-or by aryl sulphonate anion.

4,288,440

PYRIDINONES

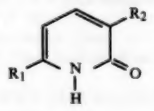
Gilbert A. Youngdale, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 29, 1980, Ser. No. 182,554

Int. Cl.³ C07D *213/64, 213/48, 401/04;* **A61K** *31/41*

U.S. Cl. 424—263 **15 Claims**

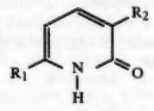
1. A 6-alkyl-1,2-dihydro-2-oxo-3-substituted pyridine derivative of the Formula II,



II

wherein R_1 is alkyl of four to eight carbon atoms, inclusive, and R_2 is tetrazolyl or carboxaldehyde.

6. A method of treating adult-onset diabetes mellitus in a human suffering from said disease which comprises orally administering an amount of a 6-alkyl-1,2-dihydro-2-oxo-3-substituted pyridine derivative of the Formula II



II

wherein R_1 and R_2 are as defined in claim **1**, effective to exert a predetermined systemic antihyperglycemic effect.

4,288,441

NICOTINOYL PANTETHEINE DERIVATIVES

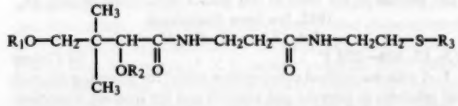
Tosaku Miki; Akashi Eriguchi; Yasushi Abiko, and Kinya Kameda, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1980, Ser. No. 173,447

Int. Cl.³ C07D *401/14;* **A61K** *31/455;* **C07D** *401/12*

U.S. Cl. 424—266 **6 Claims**

1. A compound of the formula:



wherein R_1, R_2 and R_3 each represents a member selected from the group consisting of hydrogen and nicotinoyl, with the proviso that R_1, R_2 and R_3 do not all simultaneously represent hydrogen, and the nontoxic acid addition salts thereof.

5. A method of prolonging effective levels of free nicotinic acid in the blood comprising:

administering to a host subject a therapeutically effective amount of the compound of claim **1**.

4,288,442

INHIBITING ADRENERGIC β-RECEPTORS WITH PIPERIDINOPROPYL DERIVATIVES

Walter-Gunar Friebe, Darmstadt; Helmut Michel, Mannheim; Carl H. Ross, Viernheim; Fritz Wiedemann, Weinheim-Lützelsachsen; Gisbert Sponer, Hemsbach, and Wolfgang Schaumann, Heidelberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Postfach, Fed. Rep. of Germany

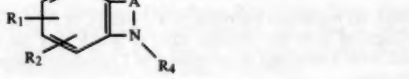
Filed Jan. 31, 1980, Ser. No. 117,172

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2905876

Int. Cl.³ A61K *31/445;* **C07D** *401/12, 401/14*

U.S. Cl. 424—267 **10 Claims**

1. A piperidinopropyl derivative of the formula



in which

R_1 and R_2 each independently is hydrogen or a lower alkyl radical, or together are a C_{2-4}-alkylene radical,

R_3 is hydrogen, hydroxy, or lower alkanoyloxy,

R_4 is hydrogen or formyl,

A is (a) $—X_1=Y_1$ in which

(i) X_1 and Y_1 each independently is a nitrogen atom or $—C(R_6)=$, in which

(A)R_6 is hydrogen, a lower alkyl radical optionally substituted by hydroxy or lower alkanoyloxy, a carboxyl radical or an alkoxycarbonyl radical, or

(b)$—X_2—Y_2$ in which

(i) X_2 is $—CH_2—$ or $—N(R_7)—$, in which (A)R_7 is hydrogen or lower alkyl, and

(ii) Y_2 is $—CH_2—$ or $—C(=Z)—$, in which (A)Z is oxygen or sulfur, or

(c)$—CR_8=CR_9—$ in which

(i) R_8 and R_9 together are a $—CH=CH—CH=CH—$ bridge, with the proviso that when present, it is Y_1 or Y_2 which is connected to $N—R_4$, and

B is a pyridyl, primidyl, benzimidazolinonyl, benzimidazolinyl, benztriazolyl, indazolyl, benzodioxolanyl or carbazolyl radical or, if A is $—X_2—Y_2—$ or $—CR_8=CR_9$, may also be a phenyl radical, either of which is optionally substituted by halogen, hydroxyl, lower alkyl, hydroxy-lower alkyl, carboxamido-lower alkyl, lower alkoxy, amino, carboxamido, lower alkyl-carbonylamino, lower alkanoyloxy or lower alkylsulphonylamino,

or a pharmacologically acceptable salt thereof.

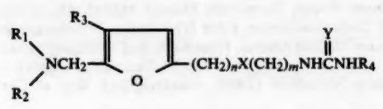
9. A method of inhibiting adrenergic β-receptors and lowering blood pressure in a patient which comprises administering to such patient an adrenergic β-receptor-inhibiting or blood pressure lowering effective amount of a compound or salt according to claim **1**.

4,288,443
SUBSTITUTED FURAN COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Duncan B. Judd, Ware; John W. Clitherow, Sawbridgeworth; Barry J. Price, Hertford, and John Bradshaw, Ware, all of England, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 950,440, Oct. 11, 1978, abandoned.
This application Feb. 25, 1980, Ser. No. 124,115
Claims priority, application United Kingdom, Oct. 11, 1977, 42256/77
Int. Cl.³ A61K *31/34*; C07D *307/54*
U.S. Cl. 424—267 6 Claims

1. Compounds of the general formula



(I)

and physiologically acceptable salts and N-oxides, hydrates and bioprecursors thereof, in which R_1 and R_2 which may be the same or different each represent hydrogen, C_{1-8} alkyl, C_{4-8} cycloalkyl, C_{3-6} alkenyl, aralkyl with 1 to 4 carbon atoms in the alkyl residue or C_{1-8} alkyl interrupted by an oxygen atom or a group

in which R_5 represents hydrogen or C_{1-8} alkyl, or R_1 and R_2 may together with the nitrogen atom to which they are attached, form a saturated monocyclic 5 to 7 membered heterocyclic ring;

R_3 represents straight or branched chain C_{1-8} alkyl, alkoxyalkyl with 1 to 8 carbon atoms in each alkyl residue, C_{1-8} hydroxyalkyl, C_{1-8} alkoxycarbonyl, alkyl thioalkyl with 1 to 8 carbon atoms in each alkyl residue, halogen or aryl;

R_4 represents hydrogen, C_{1-8} alkyl, C_{3-6} alkenyl or alkoxyalkyl with 1 to 8 carbon atoms in each alkyl residue;

X represents —O— or —S—;

Y represents =S, =O, $=NR_6$ or $=CHNO_2$ where R_6 represents hydrogen, nitro, cyano, C_{1-8} alkyl, aryl, C_{1-3} alkylsulphonyl or arylsulphonyl;

m represents an integer from 2 to 4 inclusive; and

n represents an integer which is 1 or 2, or additionally when X is —S— n may also be zero.

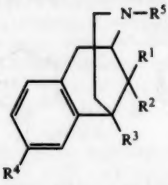
6. A method of treating a condition mediated through histamine H_2-receptors which comprises administering to a patient an effective amount of a compound as defined in claim 1 to relieve said condition.

4,288,444
ANALGESIC AND MORPHINE-ANTAGONISTIC 6,7-BENZOMORPHANS

Antony M. Akkerman, Amsterdam; Hermanus C. C. K. van Bakel, Montfoort, and Henriette G. Van Breevoort-Uurbanus, Nieuw-Loosdrecht, all of Netherlands, assignors to ACF Chemiefarma N.V., Maarssen, Netherlands

Division of Ser. No. 36,089, May 4, 1979, Pat. No. 4,234,591, which is a continuation of Ser. No. 804,149, Jun. 6, 1977, abandoned. This application Apr. 25, 1980, Ser. No. 143,770
Claims priority, application United Kingdom, Jun. 21, 1976, 25577/76
Int. Cl.³ A61K *31/445*; C07D *405/06*
U.S. Cl. 424—267 8 Claims

1. A benzomorphan compound of the formula



or a pharmaceutically acceptable salt thereof wherein R^1 is unsubstituted phenyl or phenyl substituted by a substituent selected from the group consisting of halogen, lower alkyl, trifluoromethyl, hydroxy, lower alkoxy, di(lower) alkylamino, and piperidino; R^2 is hydrogen, halogen, hydroxy, lower alkoxy, or acetoxy; R^3 is alkyl or alkenyl having up to four carbon atoms; R^4 is hydrogen, hydroxy, lower alkoxy, lower alkanoyloxy, nicotinoyloxy, or phenyl lower alkanoyloxy; and R^5 is heteroarylalkyl containing one oxygen atom as the sole hetero atom, such heteroarylalkyl substituted in the heteroaryl group by lower alkyl, or is heterocycloalkylalkyl containing one or two oxygen atoms as the sole hetero atoms.

8. The method of raising the pain threshold and/or of counteracting the physiological effects of an opiate in a warm-blooded animal, which comprises administering to said animal an effective analgesic and/or morphine-antagonistic amount of a compound or salt as in claim 1.

4,288,445
THERAPEUTIC COMPOSITIONS CONTAINING 4-NITROISOXAZOLE

Takenori Kusumi, and Koji Nakanishi, both of New York, N.Y., assignors to Suntory Limited, Osaka, Japan

Filed Oct. 10, 1980, Ser. No. 195,746
Int. Cl.³ A61K *31/42*
U.S. Cl. 424—272 10 Claims

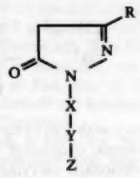
1. A pharmaceutical composition containing an amount of 4-nitroisoxazole which is effective to cause vasodilation in a patient needing such treatment together with a pharmaceutically acceptable excipient.

4,288,446
PYRAZOL-5-ONES

Eike Möller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 633,636, Nov. 30, 1975, abandoned, which is a division of Ser. No. 459,408, Apr. 9, 1974, Pat. No. 4,018,890. This application Dec. 12, 1979, Ser. No. 102,840
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1973, 2319278
The portion of the term of this patent subsequent to Dec. 28, 1993, has been disclaimed.
Int. Cl.² A61K *31/415*
U.S. Cl. 424—273 P 54 Claims

1. A pharmaceutical composition useful for effecting diuresis and saluresis in humans and animals and for treating hypertension in humans and animals which comprises a diuretic, saluretic or antihypertensive amount of a pyrazol-5-one of the formula:



or a pharmaceutically acceptable salt thereof wherein

R is hydrogen, lower alkyl or amino;

X is ethylene, ethylene wherein 1 hydrogen atom on one of the carbon atoms is substituted by lower alkyl or ethylene wherein 1 hydrogen atom on each of the two carbon atoms is substituted by lower alkyl;

Y is oxygen or sulphur;

Z is aryl of 6 to 10 carbon atoms unsubstituted or substituted by:

(a) 1 or 2 of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, and alkenoxy of 2 to 4 carbon atoms;

(b) cycloalkyl of 5, 6 or 7 carbon atoms, or cycloalkenyl of 5, 6 or 7 carbon atoms;

(c) nitro; or

(d) nitro, and 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkenoxy of 2 to 4 carbon atoms, halogen and trifluoromethyl;

in combination with a pharmaceutically acceptable nontoxic inert diluent or carrier.

4,288,447

ANTIHYPERGLYCEMIC 4-SUBSTITUTED 2-IMINOIMIDAZOLIDINE COMPOSITIONS

Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Division of Ser. No. 9,899, Feb. 6, 1979, Pat. No. 4,247,705. This application May 5, 1980, Ser. No. 146,611

Int. Cl.³ A61K *31/415, 31/445, 31/495, 31/535*

U.S. Cl. 424—273 R **4 Claims**

1. A pharmaceutical composition for the treatment of hyperglycemia comprising a pharmaceutical carrier and a hyperglycemia inhibiting quantity of a 2-iminoimidazolidine compound corresponding to the formula:

wherein R is loweralkyl; R^1 is a member selected from hydrogen, loweralkyl, phenyl, loweralkylphenyl, and chlorophenyl; R^2 is a member selected from loweralkyl, phenyl, loweralkylphenyl and chlorophenyl; X is member selected from amino, diloweralkylamino, di(phenylloweralkyl) amino, 1-piperidino, 1-piperazino, 1-morpholino, and chloro; and n is the integer 1 or 2, or a pharmaceutically acceptable acid addition salt thereof.

4,288,448

N-SUBSTITUTED IMIDAZOLE DERIVATIVES, AND THEIR USE

Ikutaro Saji; Shunji Aono, both of Osaka; Takao Okuda, and Hideo Agui, both of Sonehigashi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

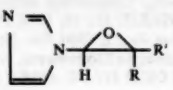
Filed Nov. 26, 1980, Ser. No. 210,619

Claims priority, application Japan, Dec. 5, 1979, 54-158581

Int. Cl.³ A61K *31/415, 31/495;* **C07D** *403/00, 405/14*

U.S. Cl. 424—273 R **18 Claims**

1. An N-substituted imidazole compound of the formula:



(I)

wherein R and R' are independently a phenyl group optionally substituted with one or more halogen, C_1–C_8 alkyl, C_1–C_8 alkoxy, C_1–C_8 alkylthio, phenyl, phenoxy, phenylthio, hydroxyl, trifluoromethyl, amino, carbamoyl, di(C_1–C_8)alkylamino, C_1–C_8 alkanoylamino, nitro, cyano, carboxy, C_1–C_8 alkoxycarbonyl, C_1–C_8 alkylsulfonyloxy or C_1–C_8 alkanoylpiperazino groups; a C_1–C_{15} alkyl group or a phenyl-(C_1–C_2)alkyl group optionally bearing halogen on the benzene ring, and its acid-addition salts.

4,288,449

N-ARYLSULFONYLPYRROLES, THEIR PREPARATION, AND THERAPEUTIC AGENTS CONTAINING THESE COMPOUNDS

Jens-Uwe Bliesener, Deidesheim; Karl-Heinz Geiss, Beindersheim; Dieter Lenke, Ludwigshafen, and Claus D. Mueller, Viernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

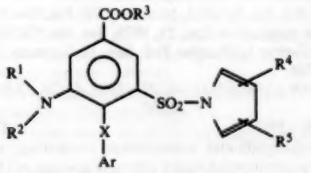
Continuation of Ser. No. 58,257, Jul. 17, 1979, abandoned. This application May 28, 1980, Ser. No. 154,036

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1978, 2831850; Apr. 11, 1979, 2914615

Int. Cl.³ A61K *31/40;* **C07D** *207/48*

U.S. Cl. 424—274 **9 Claims**

1. A compound of the formula



I,

in which

R^1 is alkyl of 2 to 5 carbon atoms, allyl, benzyl, furylmethyl, wherein the furan ring is unsubstituted or substituted by bromine, or thienylmethyl, wherein the thiophene ring is unsubstituted or monosubstituted by methyl, and R^2 is hydrogen, or

R^1 and R^2 together with the nitrogen are a pyrrolidine ring,

R^3 is hydrogen, methyl or ethyl,

R^4 and R^5 are hydrogen or R^4 is methyl or ethyl in the α-position of the pyrrole ring and R^5 is methyl, ethyl or n-propyl in the α'-position of the pyrrole ring,

X is sulfur or oxygen, or N–H and

Ar is phenyl, which is unsubstituted or substituted by chlorine

and its therapeutically useful ammonium salts, alkali metal salts or acid addition salts.

9. A pharmaceutical diuretic composition comprising an

effective amount of a compound of the formula I of claim 1 and a pharmaceutically acceptable carrier.

4,288,450

PROCESS FOR THE PREPARATION OF NOVEL BENZOPYRANE DERIVATIVES

Georges Haas, Binningen; Alberto Rossi, Oberwil; Knut A. Jaeggi, Basel, and Alex Sele, Muttenz, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

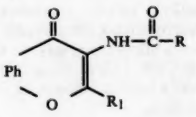
Division of Ser. No. 923,522, Jul. 11, 1978, Pat. No. 4,216,155. This application Jan. 7, 1980, Ser. No. 110,077

Claims priority, application Luxembourg, Jul. 15, 1977, 77786

Int. Cl.[3] **C07D** *311/22;* **A61K** *31/35*

U.S. Cl. 424—283 **8 Claims**

1. A 3-oxaloamino-4-oxo-4H-1-benzopyrane derivative of the formula I



(I)

in which R is carboxyl, lower alkoxycarbonyl or carbamyl which is unsubstituted or mono- or di-sub-stituted by lower alkyl, Ph is 1,2-phenylene which is di-substituted by lower alkyl, or, at two adjacent carbon atoms, by 3-membered or 4-membered lower alkylene, and R_1 is hydrogen or lower alkyl, in the free form or in the form of a salt.

4,288,451

COMBATING ARTHROPODS WITH FERROCENE-CONTAINING SYNERGISTIC COMPOSITIONS

Volker Mues, Wuppertal, and Wolfgang Behrenz, Overath, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

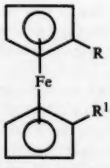
Division of Ser. No. 882,824, Mar. 2, 1978, Pat. No. 4,206,227. This application Jun. 29, 1979, Ser. No. 53,563

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711546

Int. Cl.[3] **A01N** *37/00, 37/34, 43/02, 43/08, 43/36, 55/02, 57/00, 65/00*

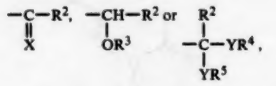
U.S. Cl. 424—295 **10 Claims**

1. An arthropodicidal composition containing, as active ingredient, an arthropodicidally effective amount of (1) at least one ferrocene derivative of the formula



in which

R and R^1 each independently is hydrogen, alkyl, or alkenyl with up to 20 carbon atoms, alkyl or alkenyl with up to 10 carbon atoms substituted by carbalkoxy with up to 4 carbon atoms per alkoxy, benzyl, nitrile, cyanomethyl, cyanoethyl;



R^2 is hydrogen, alkoxy with 1 to 10 carbon atoms; alkyl with 1 to 19 carbon atoms, cycloalkyl with 3 to 12 carbon atoms or phenyl optionally carrying at least one halogen, alkyl, hydroxyl, halogenoalkyl, nitro, nitrile or alkoxy substituent,

R^3 is hydrogen or alkyl with 1 to 8 carbon atoms,

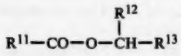
R^4 and R^5 each independently is alkyl with 1 to 6 carbon atoms or together are an alkylene radical with 1 to 6 carbon atoms,

X is oxygen, hydroxyimino or alkoxyimino with 1 to 6 carbon atoms, and

Y is oxygen or sulphur,

and (2) a compound selected from the group consisting of

(A) carboxylic acid esters of the formula



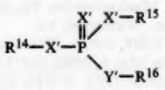
in which

R^{11} is alkyl with 1 to 6 carbon atoms optionally substituted by phenyl or halophenyl; phenyl; halophenyl; or cyclopropyl optionally substituted by alkyl, alkenyl, halogenoalkyl or halogenoalkenyl each with up to 6 carbon atoms,

R^{12} is hydrogen, alkyl with 1 to 6 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms and up to 3 halogen atoms, alkenyl, ethynyl or nitrile, and

R^{13} is phenyl optionally substituted by C_{1-4}-alkyl, halogen, phenoxy, halophenoxy, methyl-phenoxy or benzyl; furanyl, tetrahydrophthalimido or benzodioxolyl any of which is optionally substituted by halogen, alkyl or alkenyl with up to 4 carbon atoms or benzyl or, together with R^{12}, forms a cyclopentenone ring which is optionally substituted by C_{1-4}-alkyl, furfuryl or C_{1-5}-alkenyl, and naturally occurring pyrethroids, and

(B) phosphoric acid esters of the formula



in which

X' each independently is O or S,

Y' is O, S, —NH— or a direct bond between the central P atom and the radical R^{16},

R^{14} and R^{15} each independently is C_{1-4}-alkyl or phenyl, and

R^{16} is alkyl with 1 to 4 carbon atoms which is optionally substituted by halogen, hydroxyl, nitrile, optionally halogen-substituted phenyl, carbonylamide, sulphonylalkyl, sulphoxyalkyl, carbonylalkyl, alkoxy, alkylmercapto or alkoxycarbonyl; alkenyl with up to 4 carbon atoms which is optionally substituted by halogen, optionally halogen-substituted phenyl or alkoxycarbonyl; aralkyl; phenyl which is optionally substituted by methyl, nitro, nitrile, halogen or methylthio; a pyridine, quinoline, quinoxaline, pyrimidine, diazinone or benzo-1,3,4-triazine radical which is optionally substituted by C_{1-4}-alkyl or halogen; dioxanyl; an oxime radical; or a radical identical to that to which it is bonded,

the weight ratio of component (1) to component (2) being from about 0.1:10 to 10:0.1.

4,288,452

1-ARYLOXY-3-NITRATOALKYLAMINO-2-PROPANOLS AND USE AS β-RECEPTOR BLOCKER

Johannes Sombroek, Darmstadt; Karl-Heinz Becker, Dieburg; Klaus O. Minck, Ober-Ramstadt, and Hans-Joachim Enenkel, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Feb. 9, 1979, Ser. No. 10,781

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1978, 2805404

Int. Cl.³ A61K *31/21, 31/47, 31/275;* C07C *77/02*

U.S. Cl. 424—304 6 Claims

1. A 1-aryloxy-3-nitratoalkylamino-2-propanol of the formula

$$Ar—O—CH_2—CHOH—CH_2—NH—R$$

wherein

Ar is phenyl; phenyl substituted by (a) halogen, (b) cyano, (c) C_{1-7} alkanoylamino, (d) benzoylamino, (e) alkanoyl of 1–4 carbon atoms, (f) C_{1-10} alkyl, (g) C_{1-10} alkoxy, C_{1-10} alkoxy in which the carbon chain contains one ether oxygen atom, C_{1-10} alkyl in which the carbon chain contains 1 or 2 ether oxygen atoms, C_{1-10} alkylthio or C_{1-10} alkyl in which the carbon chain contains one thioether sulfur atom, (h) C_{1-10} alkenyl or C_{1-10} alkynyl, (i) the residues (g) containing a double or triple bond, (j) cycloalkyl of 3–8 carbon atoms or (k) cycloalkoxy of 3–8 carbon atoms; naphthyl; indanyl; indenyl; 1,2,3,4-tetrahydronaphthyl; indolyl; indolyl substituted by alkyl of 1–4 carbon atoms; carbazolyl; or 1,2,3,4-tetrahydro-2-oxoquinolyl, and

R is nitratoalkyl of 2–10 carbon atoms,

and the physiologically acceptable acid addition salts thereof.

6. 1-o-allyloxy-phenoxy-3-(1,1-dimethyl-3-nitratopropylamino)-2-propanol, a compound of claim 1.

4,288,453

DERIVATIVES OF ARYLALKANOIC ACIDS, COMPOSITIONS AND USE

Michel Vincent, Bagneux; Jacques Duhault, Chatou; Michelle Boullanger, Marly le Roi, and Georges Remond, Versailles, all of France, assignors to Science Union et Cie, Suresnes, France

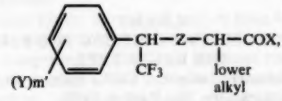
Filed Oct. 10, 1978, Ser. No. 949,571

Claims priority, application France, Oct. 7, 1977, 77 30186; Apr. 27, 1978, 78 12452

Int. Cl.³ A61K *31/19;* C07C *53/134*

U.S. Cl. 424—317 12 Claims

1. The (Aryl alkyl) alkanoic acids of the formula



including the diastereoisomers and enantiomers thereof, wherein Z is oxygen or sulphur; lower-alkyl is 1 to 5 carbon atoms, inclusive; Y is halogen, trifluoromethyl, or lower-alkyl; m' is zero or number from one to three, inclusive;

and X is hydroxy, or the grouping OM in which M is the monovalent cation of a mineral base.

7. The pharmaceutical compositions containing as active ingredient, in effective amount for hypolipemic or hypocholesterolemic action, at least one compound of claim 1 or a salt thereof in admixture with an inert non-toxic pharmaceutical carrier or vehicle.

4,288,454

ANTIVIRAL 1-ADAMANTYL-3-(PHENYLSULFONYL)THIOUREAS

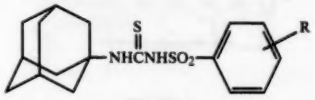
Michael J. Kramer, Glen Ridge, and Jefferson W. Tilley, North Caldwell, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 927,072, Jul. 24, 1978, abandoned. This application Dec. 13, 1979, Ser. No. 103,138

Int. Cl.³ A01N *41/06;* C07C *143/82, 143/833, 133/06*

U.S. Cl. 424—321 4 Claims

1. A method of treating a mammalian or avian host afflicted with a viral infection which comprises administering to the host an antivirally effective amount of an antiviral compound of the formula



wherein R is amino.

4,288,455

METHOD OF CONTROLLING MOLLUSC PEST

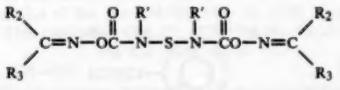
Robert G. Haines, Orange Park, Fla., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 15, 1978, Ser. No. 877,974

Int. Cl.³ A01N *33/24, 37/00, 43/24, 47/10*

U.S. Cl. 424—327 10 Claims

1. A method of controlling molluscicidal which comprises subjecting them to a molluscicidally effective amount of a compound of the formula:



wherein:

R' is alkyl having from 1 to 4 carbon atoms;

R_2 is alkyl, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy, alkanoyl or alkoxycarbonyl, all of which may be unsubstituted or aliphatically substituted in any combination with one or more cyano, nitro, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy or phenyl; or R_2 is R_4 R_5—NCO or R_6 $CON(R_4)$—groups, wherein:

R_4 and R_5 are individually hydrogen or alkyl;

R_6 is hydrogen, alkyl or alkoxy;

R_3 is hydrogen, alkyl, alkylthio, alkylsulfinyl, alkylsulfonyl or cyano;

with the provisos that:

A. the total number of carbon atoms in R_2 and R_3 together may not exceed eight; and

B. when R_2 is alkyl substituted with alkylthio, R_3 is cyano, alkyl, and alkylthio.

4,288,456

COMPOSITIONS CONTAINING 1-ARYL-5-(2-PROPENYLAMINO)-1-PENTEN-3-ONES AND METHOD FOR TREATING INFLAMMATORY CONDITIONS

Joseph E. Sundeen, Yardley, Pa.; Tamara Dejneka, Skillman, and Frederic P. Hauck, Bridgewater, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

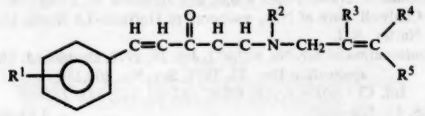
Filed Sep. 19, 1980, Ser. No. 188,647

Int. Cl.³ A61K *31/135*

U.S. Cl. 424—330 8 Claims

1. The method of treating an inflammatory condition in a mammalian species, which comprises administering to said

specie a composition comprising a therapeutically effective amount of a compound of the structure



wherein R^1 is hydrogen, lower alkyl, lower alkoxy, halogen, hydroxy, nitro or amino, and R^2, R^3, R^4 and R^5 may be the same or different and are hydrogen or lower alkyl, and physiologically acceptable salts thereof, and a pharmaceutically acceptable carrier therefor.

4,288,457

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF

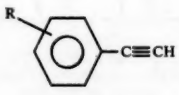
Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910, which is a division of Ser. No. 268,419, Jan. 7, 1972, Pat. No. 3,852,364. This application May 14, 1975, Ser. No. 574,837

Int. Cl.³ A61K *31/03, 31/015*

U.S. Cl. 424—353 **12 Claims**

1. A method for treating inflammation, pain or fever comprising administering to a patient suffering from said inflammation, pain or fever a therapeutically effective amount between 0.5 to 100 mg/kg of body weight per day of at least one compound of the formula:



wherein R is selected from the group consisting of

lower alkyl of 1 to 7 carbon atoms,

cycloalkyl of 5 to 7 carbon atoms,

1-7 carbon atoms alkyl substituted cycloalkyl of 5 to 7 carbon atoms,

cycloalkenyl of 5 to 7 carbon atoms, and

1-to 7 carbon atoms alkyl substituted phenyl.

4,288,458

FISH SILAGE

Edward Barnes, Orwell, England, assignor to BP Nutrition (UK) Limited, London, England

Continuation of Ser. No. 901,510, May 1, 1978, abandoned. This application Nov. 16, 1979, Ser. No. 94,851

Int. Cl.³ A23J *1/04*

U.S. Cl. 426—7 **11 Claims**

1. A process for preparing liquified fish silage which comprises admixing unground fish solids having dimensions up to 6 inches by 15 inches with liquified fish silage in a ratio in the range of from 10:1 to 1:10 by weight and an additive present in at least an amount capable of initiating and accelerating liquifaction of said fish solids, the additive being selected from the group consisting of organic acids, mineral acids, salts thereof, and enzymes; and effecting liquifaction of said fish solids in the presence of said liquified fish silage and at a temperature of at least 20° C.

4,288,459

LOW FAT IMITATION SOUR CREAM

Donald B. Baker, Tulsa, Okla., assignor to The Pro-Mark Companies, Tulsa, Okla.

Filed Sep. 28, 1979, Ser. No. 80,150

Int. Cl.³ A23C *9/12, 3/08, 23/00*

U.S. Cl. 426—43 **12 Claims**

1. A method for making a low fat milk product which resembles sour cream in appearance, texture and taste comprising the steps of:

(a) admixing milk having a butterfat content of 0.7 to 7% by weight and a stabilizer;

(b) heating said mixture to a temperature in the range of from about 150° to 180° F. (65.5° to 82.2° C.) for a time sufficient to form a uniform, substantially homogeneous mixture and to effect pasteurization;

(c) admixing bakers cheese curd and the resultant milk-stabilizer mixture from step (b) to coat said bakers cheese curd therewith and to form a bakers cheese curd mixture, said bakers cheese comprising about 40 to 70% by weight of said mixture and the relative proportions of milk and bakers cheese curd being selected to provide a fat content in said product of less than about 2% by weight;

(d) agitating said curd mixture to a substantially uniform and fluid consistency;

(e) maintaining said curd mixture at a temperature in the range of 70° to 130° F. (21.1° to 54.4° C.) and adding thereto a lactic acid producing bacterial culture;

(f) adding flavorants comprising at least one edible acid, lipase modified butterfat and starter distillate and a preservative at any time after step (b) and prior to step (g); and

(g) homogenizing said bacterial culture, flavorant and preservative containing bakers cheese curd mixture at pressures in the range of 500 to 5000 psig (35.15 to 351.5 kg/cm^2).

4,288,460

NON-CAKING, WATER-SOLUBLE, GRANULAR COATED FOOD INGREDIENT

Paul Ciliberto, Slate Hill, and Stanley Kramer, Middletown, both of N.Y., assignors to Balchem Corporation, Slate Hill, N.Y.

Filed May 24, 1979, Ser. No. 41,804

Int. Cl.³ A23L *1/04, 2/00, 3/34;* **C09K** *3/00*

U.S. Cl. 426—96 **14 Claims**

1. A non-caking granular food ingredient composition comprising core particles of a normally hygroscopic, water-soluble food ingredient and a continuous encapsulating coating on said core particles consisting essentially of 5-37% of fatty acid derivative selected from the group consisting of polyoxyethylene sorbitan monooleate, polyoxyethylene sorbitan monostearate and lecithin, 15-56% propylene glycol and 38-62% finely divided flow agent.

4,288,461

METHOD OF SELECTIVE PITTING FOR FRUITS OF THE DRUPE TYPE

Konrad E. Meissner, Lafayette, Calif., assignor to California Processing Machinery, San Ramon, Calif.

Division of Ser. No. 880,229, Feb. 22, 1978, Pat. No. 4,213,382. This application Jan. 11, 1980, Ser. No. 111,371

Int. Cl.³ A01K *43/00*

U.S. Cl. 426—231 **11 Claims**

1. A method of pitting fruits of the drupe type at a single pitting station, some having sound pits and some having partially or completely split pits and presented randomly in succession to said station, comprising the steps of

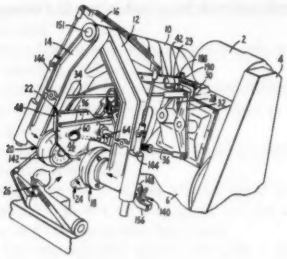
supporting each whole fruit as said station with its suture substantially in a predetermined plane;

substantially bisecting the body of said fruit in said plane and, at the same time, moving opposed pit-gripping means

through the body of said fruit in said plane toward the edges of said pit;

sensing if said pit is sound or split by sensing whether said movement of said pit-gripping means is arrested by gripping engagement of said pit at a first position or continues past the pit-gripping position to a second position;

upon said pit-gripping means engaging and gripping the edges of a sound pit, holding the same against rotation and rotating the halves of said fruit body relative to said pit-gripping means about an axis extending transversely to said plane and extending through said pit to shear said fruit body halves from the held sound pit; and



upon sensing the presence of a split pit, shifting said pit gripping means away from said pit and said second position and through said fruit body to a third position remote from said pit to bring a coring spoon spaced from said pit-gripping means into a position in said plane which is adjacent said split pit, and then rotating said coring spoon about an axis extending through said split pit without rotation of said fruit halves such that said coring spoon rotation describes a complete body of revolution and cuts a core, including said split pit, corresponding to such body of revolution from said fruit halves.

4,288,462

METHOD FOR REMOVING CATIONIC CONTAMINANTS FROM BEVERAGES

Kenneth C. Hou, Glastonbury, and Eugene A. Ostreicher, Farmington, both of Conn., assignors to AMF Incorporated, White Plains, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,142
Int. Cl.³ C12H *1/00*
U.S. Cl. 426—423 **8 Claims**

1. A process for the removal of haze or haze formers which are cationic submicronic proteinaceous contaminants from a beverage, comprising conducting a beverage containing such contaminants through a filter media having an anionic electrokinetic capture potential for such contaminants, the filter media being prepared by:

a. treating filter elements selected from the group consisting of cellulose pulp and particulate filter aids with an amount of inorganic cationic colloidal silica surface charge modifier to render the surface of the filter elements receptive to the subsequent deposition of an inorganic anionic colloidal silica charge modifier, thereafter,

b. charge modifying the treated filter elements with an inorganic anionic colloidal silica charge modifier, and

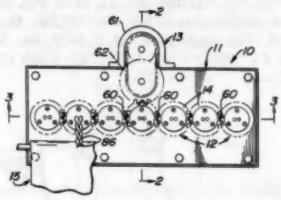
c. forming the filter elements into a sheet having a negative zeta potential and a wet strength of at least 2.5 kg/in.

4,288,463

METHOD OF MAKING PRETZELS OF SELECTED SPIRAL PITCH

Edwin I. Groff, and Edwin T. Groff, both of 120 S. 3rd Ave., West Reading, Pa. 19611

Continuation of Ser. No. 6,359, Jan. 25, 1979, abandoned, which is a division of Ser. No. 913,582, Jun. 8, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,374
Int. Cl.³ D21C *11/16*
U.S. Cl. 426—500 **2 Claims**



1. In the method of manufacturing pretzels, the steps which comprise: extruding pretzel dough to form at least one dough strand, rotating said dough strand during extrusion about an eccentric axis to spirally wind the dough strand, gravitationally passing the dough strand downwardly during said rotation through a vertical distance from the point of final extrusion onto a conveyor belt, varying said vertical distance to change the wound spiral to a selected spiral pitch, and conveying away on the conveyor belt the spirally wound dough strand of the selected pitch for baking.

4,288,464

FLAVOR ENHANCER

Walton J. Smith, Rte. 4, Grafton, N.H. 03240

Continuation of Ser. No. 904,890, May 11, 1978, abandoned. This application Oct. 19, 1979, Ser. No. 86,432
Int. Cl.³ A23L *1/236*
U.S. Cl. 426—548 **8 Claims**

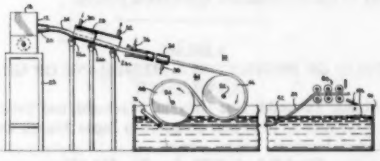
1. A flavor enhancer prepared by drying an aqueous composition comprising 1-5 parts of artifical sweetener, ½ to 1 part maltol or ethyl maltol, and 5 to 10 parts of a soluble low DE polysaccharide.

4,288,465

PREPARING CHEESE HAVING LONGITUDINAL FIBROUS TEXTURE

Matthew Meyer, 1001 E. 17th St., Marshfield, Wis. 54449

Filed Jun. 13, 1979, Ser. No. 48,525
Int. Cl.³ A23C *19/024*
U.S. Cl. 426—582 **19 Claims**



1. A process for manufacturing a cheese product having defined longitudinal fibrous texture properties from a cheese capable of forming a fibrous texture when stretched, said process comprising the steps of:

extruding a continuous strand of heated cheese;

continuously applying a longitudinal pulling force to the continuous strand after extrusion to induce longitudinal fibrous texture properties in the heated strand and reduce the cross-sectional size of the strand; and

cooling the strand at least after applying the longitudinal pulling force.

4,288,466

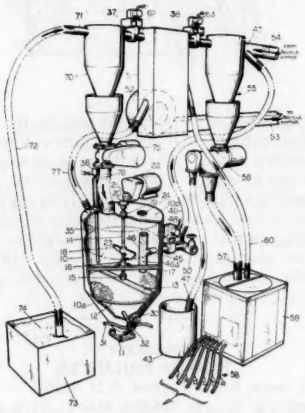
POWER PRECONDITIONING FOR ELECTROSTATIC APPLICATION

Russell W. Heckman, Perrysburg, and George A. Nickey, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 923,868, Jul. 12, 1978, Pat. No. 4,170,074, which is a continuation of Ser. No. 747,586, Dec. 6, 1976, abandoned. This application Jul. 2, 1979, Ser. No. 54,326

Int. Cl.³ B05D *1/06, 7/22, 3/02;* **F26B** *17/10*

U.S. Cl. 427—28 **7 Claims**



1. In the process for applying organic hygroscopic powder to coat a preheated glass container wherein said powder is electrostatically applied to said glass container in a powder application station and the adhered powder is subsequently thermally fused on said glass container to form a smooth coating, the improvement wherein said hygroscopic powder is preconditioned in a preconditioning zone prior to electrostatic application to said glass container by passing a stream of dry, inert gas having a dew point of less than about 35° F. upwardly through a mass of said powder at a rate sufficient to suspend said powder in said stream as a fluidized bed and mechanically agitating said fluidized bed for a residence time sufficient to yield a substantially dry, free flowing powder, separating the free flowing powder from said stream by aspirating through an outlet disposed intermediate of open ends of a vertical conduit immersed in said bed, and then transferring said free flowing powder to the electrostatic application station.

4,288,467

METHOD OF PRODUCING A MEMBRANE OF GRAFT COPOLYMER

Sueo Machi, Takasaki; Isao Ishigaki, Maebashi, and Takanobu Sugo, Gunma, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

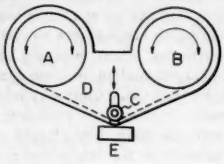
Filed Feb. 4, 1980, Ser. No. 118,105

Claims priority, application Japan, Feb. 5, 1979, 54-11995

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—44 **4 Claims**

1. A method of producing a membrane of graft copolymer by irradiating a polyolefin film with ionizing radiation before or simultaneously with graft copolymerizing an olefinic monomer or a mixture of olefinic monomer and a polyene compound onto the polyolefin, said method being characterized by graft copolymerization wherein the polyolefin film is transported in a forward direction from a fixed reversing roller to another fixed reversing roller via an intermediate mobile roller and when the film comes to its end, it is transported in a reverse



direction, and said mobile roller is moved in a direction in which it applies a stretching load on the film being transported.

4,288,468

PROCESS FOR ENCAPSULATING ELECTRICAL COMPONENTS BY VORTEX SINTERING

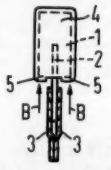
Ferdinand Utner, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,568

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830893

Int. Cl.³ B05D *1/32*

U.S. Cl. 427—45.1 **4 Claims**



1. A process for encapsulating electrical components with hardenable casting resin, said components each having wire leads joined to a component body, said process comprising the steps of:

outwardly bending top edges of a pair of opposed adhesive heat-insulating strips;

placing a component lead between said strips;

gluing said strips to said component lead;

pressing said top edges of the adhesive strips against the lead wires after gluing to cover the lead up to a point at which the lead joins the component body;

heating the surface said component body by induction in a high frequency field;

moving the component through a vortex bath of said resin in powder form to sinter the powder to the surface of the component body;

removing loose resin powder from said insulating material;

smoothing the sintered resin on the surface of the component body by subjecting the body to further heat to melt the resin; and

allowing the sintered resin to harden.

4,288,469

ANODIZED ALUMINIUM ROLLERS WITH IMPROVED ELECTRICAL CONDUCTIVITY AND A PROCESS FOR THEIR MANUFACTURE

Rudolf Meyer, Leverkusen; Günther Koepke, Odenthal, and Roland Hourticolon, Leichlingen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 20, 1979, Ser. No. 95,964

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1978, 2851153

Int. Cl.³ C23C 9/02; B44D 1/18

U.S. Cl. 427—57 4 Claims

1. A process for producing a transporting roller comprised of aluminum with a surface adapted for transporting photographic materials

and having a highly insulating porous anodic oxide formed on the member surface,

with conductive surfaces on the anodized oxide layer including the steps of immersing the member in an aqueous cleaning liquid

subjecting the anodic oxide layer of the immersed member to ultrasonic treatment

impregnating the pores of the treated oxide layer with an aqueous solution of a wetting agent and the salt of a conductive and corrosion-resistant metal,

treating the impregnated metal salt with a solution of a reducing agent to reduce the metal salt in the oxide,

and forming a conductive layer on the outer surface of the oxide layer and conductive surfaces in the pores

so that the surface layer is in conductive connection with the aluminum roller.

4,288,470

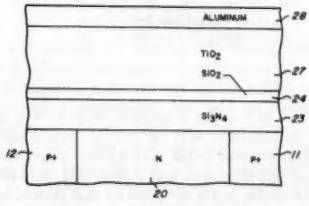
METHOD OF MAKING NON-VOLATILE SEMICONDUCTOR MEMORY ELEMENTS HAVING MULTIPLE DIELECTRIC LAYERS OF SILICON NITRIDE, SILICON DIOXIDE, AND RUTILE TITANIUM DIOXIDE

Robert T. Bate, Garland, and Henry B. Morris, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 968,545, Dec. 11, 1978, Pat. No. 4,250,206. This application Sep. 15, 1980, Ser. No. 187,230

Int. Cl.³ H01L 21/316, 21/318

U.S. Cl. 427—88 11 Claims



1. A method of making a semiconductor memory element comprising the steps of:

forming a layer of silicon nitride directly upon the material of a silicon substrate;

forming a layer of silicon dioxide upon said nitride layer;

depositing a layer of titanium upon said oxide layer;

oxidizing said titanium layer in an oxidizing ambient between 200 degrees C. and 1200 degrees C. to form a type of titanium dioxide known as rutile; and

forming a conducting layer upon said titanium dioxide layer.

4,288,471

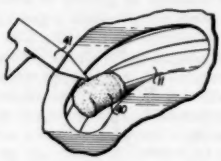
CABLE END SEALING METHOD

Jerry W. Lanier, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed May 5, 1980, Ser. No. 146,887

Int. Cl.³ B05D 3/00, 5/00, 7/20

U.S. Cl. 427—120 13 Claims



1. The method of sealing the ends of an insulated electrical conductor against penetration by moisture and other contaminants comprising the steps of passing solid thermoplastic adhesive from a remote reservoir to a means for melting said adhesive and applying molten thermoplastic adhesive to the open ends of an insulated electrical conductor in a manner whereby said adhesive bonds to the insulated surface of said insulated conductor and seals the open ends of said conductor against penetration by moisture and other contaminants, wherein said thermoplastic adhesive comprises an ethylene vinyl acetate polymer characterized by:

a melt temperature range of from about 300° F. to about 375° F.;

a viscosity of about 1800 cps at 375° F.; and

a specific gravity of about 0.95 to about 0.99 at 75° F.

4,288,472

METHOD OF PRODUCING UNIFORM SYNTHETIC RESIN COATINGS ON WORKING CASTS FOR DENTAL APPLICATIONS

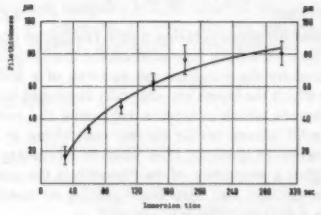
Knud D. Jorgensen, Copenhagen, Denmark, assignor to Etablissement Dentaire Ivoclar, Munich, Fed. Rep. of Germany

Filed Dec. 7, 1979, Ser. No. 101,985

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1978, 2852984

Int. Cl.³ A61C 13/00

U.S. Cl. 427—133 9 Claims



1. A method of producing a uniform synthetic resin coating on a working cast for dental applications which comprises:

(A) applying to or introducing in said working cast a first catalyst component which when initiated by a second catalyst component effects polymerization of a polymerizable composition;

(B) thereafter applying to said working cast a composition comprising said second catalyst component and a polymerizable composition which when polymerized forms said resin; and

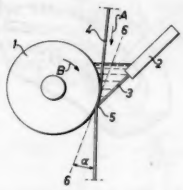
(C) thereafter effecting polymerization of said polymerizable composition to form a film.

4,288,473

PROCESS FOR APPLYING A COATING TO BOTH SIDES OF A RUNNING PAPER WEB

Hans I. Wallsten, Lausanne, Switzerland, assignor to Inventing S.A., Switzerland

Filed Apr. 24, 1979, Ser. No. 32,921
Int. Cl.³ B05D *1/00, 5/00*
U.S. Cl. 427—209 **6 Claims**



1. A continuous process for applying a coating to both sides of a paper web, said process comprising the steps of:

(a) feeding the web at a speed of at least 400 meters per minute through the nip formed between a rotating applicator roll and an elastically yielding blade having an edge which urges the web towards the roll, whereby a first sump is formed between the paper web and the roll and a second sump is formed between the paper web and the blade;

(b) feeding a coating composition into each of said first and second sumps at a rate such that the amount of coating material applied to the web, calculated as the total of both sides of the web, exceeds 14 grams per square meter;

(c) maintaining the viscosity of the coating composition in said first and second sumps at 400 to 2000 centipoises; and

(d) withdrawing the paper web from the nip, so that it is bent away from the applicator roll over the edge of the blade at an angle of between 8° to 12° to the tangient to the roll at the nip.

4,288,474

CONVEYOR BELTING

Gilbert E. Watts, Beverley, England, assignor to J. H. Fenner & Co. Limited, Hull, England

Filed Jun. 3, 1980, Ser. No. 156,039
Int. Cl.³ B05D *3/12*
U.S. Cl. 427—290 **12 Claims**

1. A method for manufacturing textile reinforced conveyor beltings of the solid woven type wherein the textile carcass has been produced by the simultaneous weaving of a multilayer structure in which the layers are integrally combined by means of binder threads which comprises subjecting the outer surfaces of a solid woven textile carcass comprising at least a major proportion of synthetic fiber yarns to a brushing action so as to roughen a proportion of the filaments in the outermost yarns of the carcass, and then impregnating or coating the carcass with a polyvinylchloride material.

4,288,475

METHOD AND APPARATUS FOR IMPREGNATING A FIBROUS WEB

Brian L. Meeker, 1846 Winston, Toledo, Ohio 43614

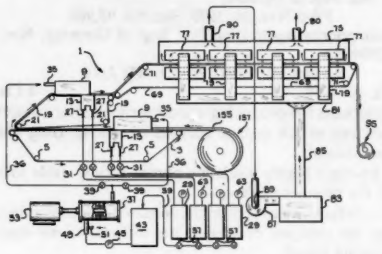
Filed Oct. 22, 1979, Ser. No. 87,207
Int. Cl.³ C23C *13/08;* **B05D** *3/00, 3/02*
U.S. Cl. 427—294 **10 Claims**

1. A method for impregnating a web of fibrous material comprising the steps of:

advancing a web of fibrous material having a first and a second surface along a path;

applying a foamed binder material to the first surface of the web, the foamed binder material sealing the first surface of the web; and

applying a source of vacuum to the second surface of the web, the vacuum being applied at a first and second location to the second surface of the web, the vacuum from the first and second locations overlapping in effect on the



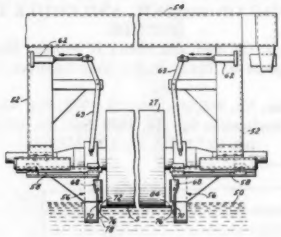
web, the vacuum compressing the web of fibrous material to an extent where the web is no more than one half its original thickness whereby the resistance to flow through the web is substantially uniform, the source of vacuum drawing the foamed binder into the web to impregnate the web with binder material.

4,288,476

ONE SIDE COATING OF CONTINUOUS STRAND

Herbert Wald, Baltimore; Harold K. Young, Dundalk, and Lacy C. Meadows, Baltimore, all of Md., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 12,927, Feb. 16, 1979, Pat. No. 4,207,831.
This application May 12, 1980, Ser. No. 148,655
Int. Cl.³ B05D *3/04*
U.S. Cl. 427—300 **6 Claims**



1. The method of coating a metallic strip with a molten coating metal on one side only, the second side of said strip being free of said coating metal, said process comprising the steps of cleaning said strip such that at least said one side to be coated is free of oxides and is wettable by said molten coating metal, providing a container for said molten coating metal, maintaining a bath of molten coating metal at a predetermined level within said container, moving said strip through said bath below said predetermined level, said strip following an arcuate path through said bath and supported therein by means of a deflector roll in contact with said second side of said strip and having a width less than the width of said strip, and preventing the coating of said second side of said metallic strip by said molten coating metal by directing a stream of gas toward the strip edges of said second side projecting beyond said deflector roll and against the surface of said bath of molten coating metal as said metallic strip moves through said bath.

4,288,477

READILY THERMOWELDABLE FILMS OF POLYOLEFINS COATED WITH LACQUERS BASED ON KETONIC RESINS

Fosco Bordini, and Luigi Mauri, both of Terni, Italy, assignors to Moplefan S.p.A., Milan, Italy

Filed Oct. 23, 1978, Ser. No. 953,873

Claims priority, application Italy, Oct. 24, 1977, 28894 A77

Int. Cl.[3] B32B *27/08, 27/38*

U.S. Cl. 428—35 7 Claims

1. Bags and packaging articles formed of a heat-sealed film of normally solid polypropylene consisting essentially of recurring propylene units, having a substantial crystalline polypropylene content, said film being coated on at least one of its surfaces with a ketonic resin or with a mixture of a ketonic resin and at least one polymer selected from the group consisting of vinyl, acrylic and cellulose polymers.

4,288,478

PARISON AND METHOD FOR FORMING PARISONS FOR BIAXIAL ORIENTATION BLOW MOLDING

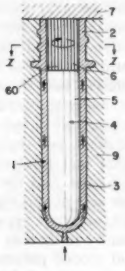
Harumi Kinoshita, Tokyo; Yoshiaki Hayashi, Matsudo, and Tadao Saito, Tokyo, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Japan

Filed Sep. 18, 1979, Ser. No. 76,769

Claims priority, application Japan, Nov. 14, 1977, 52-136427; Nov. 14, 1977, 52-136430

Int. Cl.[3] B65D *1/00;* B29C *17/07;* B29D *23/02*

U.S. Cl. 428—35 4 Claims



1. In a process for making injection-molded parison preforms for biaxial orientation blow molding of saturated polyester resin bottles, said preform having a body portion, a neck portion and a central axis, and said neck portion having an internal periphery and an external periphery, comprising forming a mold cavity for injection molding said preform, injecting molten resin into said mold cavity, and allowing said molten resin to solidify to form said preform, an improvement which comprises utilizing a mold cavity defined by an outer mold, a central core and a core plate, said central core having a rotatable base adjacent to the internal periphery of the neck portion of said preform and a stationary core extension adjacent to said body portion, said base being rotatable independent of said core extension, and applying a rotary force in one direction around the central axis of the preform, said force exerted only on the internal periphery of the neck portion of the preform by rotation of said rotatable base after said molten resin is injected into said mold cavity and while the injected resin is still at a temperature at which orientation is effected.

3. A product of the process of claim 1.

4,288,479

RADIATION CURABLE RELEASE COATINGS

Karl Brack, Holliston, Mass., assignor to Design Cote Corp., Westminster, Mass.

Continuation-in-part of Ser. No. 400,364, Sep. 24, 1973, Pat. No. 3,989,609. This application May 7, 1975, Ser. No. 575,252

Int. Cl.[3] B32B *31/28, 33/00*

U.S. Cl. 428—40 22 Claims

1. The method of making an adhesive or transfer design laminate comprising a release layer in dry-stripping removable contact with said adhesive or transfer design, said method comprising forming as said release layer a liquid film of radiation polymerizable material, said liquid containing an effective amount of a release material having low adhesion to said adhesive or transfer design and being of limited compatibility in said liquid such that a thin layer thereof migrates to the surface of said film, curing said film to a flexible solid layer by irradiation without substantial evaporation of solvent, and applying said adhesive or transfer design to the surface of said cured film.

4,288,480

PRESSURE SENSITIVE ADHESIVE COMPOSITION AND COATED PRODUCT

Gerald G. Grzywinski, and Edward J. Foley, both of Gorham, Me., assignors to Scott Paper Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 914,566, Jun. 12, 1978, abandoned. This application May 14, 1979, Ser. No. 38,393

Int. Cl.[3] B32B *25/06;* C08F *19/08*

U.S. Cl. 428—40 5 Claims

1. A pressure-sensitive adhesive composition comprising a mixture of:

A. 100 parts by weight of an unvulcanized elastomer component comprising at least one block copolymer of styrene and either isoprene or butadiene, with a polystyrene block on at least one end of the block copolymer;

B. about 100 to about 250 parts by weight of a tackifying resin component compatible with the elastomer component;

C. about 10 to about 75 parts by weight of a plasticizer component; and

D. about 2 to about 100 parts by weight of a modifier component consisting essentially of unvulcanized cis-1,4-polybutadiene.

4,288,481

FOIL VIDEO DISCS

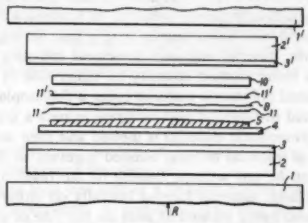
David E. Birt, London, and Peter J. Clarke, South Ruislip, both of England, assignors to EMI Limited, Hayes, England

Filed Jul. 11, 1980, Ser. No. 168,643

Claims priority, application United Kingdom, Jul. 14, 1979, 24622/79

Int. Cl.[3] B29C *3/00*

U.S. Cl. 428—64 11 Claims



1. A method of moulding a thermoplastics foil to form a video disc comprising the steps of:

(a) providing means for impressing a thermoplastics foil with a satin finish consisting of a surface irregularity of C.L.A. depth between 250 nm and 1000 nm and in a first pressing

operation impressing a surface of the foil with the satin finish,

(b) providing a pressing arrangement for use in a second pressing operation, the arrangement comprising a pair of substantially parallel mould blocks, means for applying pressure to the mould blocks, a pair of substantially parallel stamper plates mounted between the mould blocks, at least one of the stamper plates bearing at its surface a relief structure indicative of information or data to be impressed and between an adjacent mould block and stamper plate a resilient material compensator comprising a body of a resilient material having a convex surface and in said second pressing operation pressing the foil between the opposed stamper plates to impart to said surface thereof having the satin finish an impression of the micro relief structure.

4,288,482

WEATHERSTRIP WITH SUBSTRATE OF TWO DIFFERENT MATERIALS

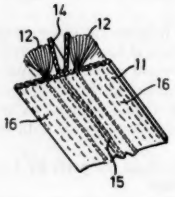
Frank W. Beck, Burlington, Canada, assignor to Schlegel Corporation, Rochester, N.Y.

Filed Sep. 9, 1980, Ser. No. 185,662

Claims priority, application United Kingdom, Jan. 31, 1980, 3267/80

Int. Cl.³ D04H *11/00*

U.S. Cl. 428—92 **15 Claims**



1. A flexible material for use as weatherstripping comprising a flexible substrate of woven strands of material; a pile strip of resilient fibers upstanding from said substrate, secured thereto and extending longitudinally of said substrate; and a barrier strip of impervious, flexible sheet material located within or immediately beside said pile strip, secured to said substrate and also extending longitudinally of said substrate; said strands of said substrate being composed of at least first and second different polymeric materials and a structural integrity maintaining material; said first polymeric material being a heat sealable material, being the same material as that of said barrier strip, being located in a region adjacent to said pile strip and extending longitudinally of said substrate to provide a region in said substrate to which said barrier strip is heat sealed; said second polymeric material and said structural integrity maintaining material being located laterally on either side of said region; said second polymeric material being a thermoplastic material distributed throughout said substrate in such a way that when said thermoplastic material is melted and then solidified, said strands of material become bonded together so that said substrate can be cut without fraying of the resulting edge, said thermoplastic material located laterally on either side of said region also being located at least on the side of said substrate opposite from the side from which said fibers upstand to provide a surface which can be heat sealed to compatible material; said structural integrity maintaining material being distributed throughout said thermoplastic material in such a way that when said thermoplastic material is melted, said structural integrity maintaining material preserves the structural integrity of said substrate.

4,288,483

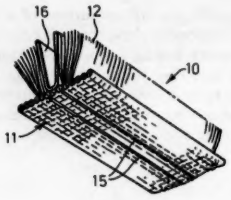
WEATHERSTRIP WITH HEAT SEALED SUBSTRATE

Stanley R. Miska, Rochester, and Jay E. Boyce, Honeoye Falls, both of N.Y., assignors to Schlegel Corporation, Rochester, N.Y.

Filed Sep. 9, 1980, Ser. No. 185,663

Int. Cl.³ D04H *11/00*

U.S. Cl. 428—92 **22 Claims**



1. A flexible material for use as weatherstripping comprising a flexible substrate of woven strands of material; a pile strip of resilient fibers upstanding from said substrate, secured thereto and extending longitudinally of said substrate; and a barrier strip of impervious, flexible sheet material located within or immediately beside said pile strip, secured to said substrate and also extending longitudinally of said substrate; said strands of said substrate being composed of at least first and second different polymeric materials and a structural integrity maintaining material; said first polymeric material being a heat sealable material, being the same material as that of said barrier strip, being located in a region adjacent to said pile strip and extending longitudinally of said substrate to provide a region in said substrate to which said barrier strip is heat sealed; said second polymeric material and said structural integrity maintaining material being located laterally on either side of said region and at least one strand of said second polymeric material also being located on the side of said region remote from said barrier strip such that said first polymeric material is essentially located between said barrier strip and said at least one strand of said second polymeric material; said second polymeric material being a thermoplastic material distributed throughout said substrate in such a way that when said thermoplastic material is melted and then solidified, said strands of material become bonded together so that said substrate can be cut without fraying of the resulting edge, said thermoplastic material located laterally on either side of said region also being located at least on the side of said substrate opposite from the side from which said fibers upstand and thereby providing with said at least one strand of said second polymeric material a surface which can be heat sealed to compatible material; said structural integrity maintaining material being distributed throughout said thermoplastic material in such a way that when said thermoplastic material is melted, said structural integrity maintaining material preserves the structural integrity of said substrate.

4,288,484

NOVEL FIBROUS ASSEMBLY AND PROCESS FOR PRODUCTION THEREOF

Susumu Norota; Tsutomu Kiriyama, and Tadasi Imoto, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jun. 8, 1979, Ser. No. 46,753

Claims priority, application Japan, Jun. 13, 1978, 53-70315; Nov. 21, 1978, 53-142817

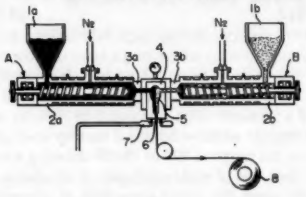
Int. Cl.³ B32B *5/12*

U.S. Cl. 428—113 **17 Claims**

1. A fibrous assembly of many fibers, the individual constituent fibers being interconnected at random in a spaced-apart relationship so that when spread in a direction at right angles to the longitudinal axes of the fibers, said assembly forms a continuous integral reticulated structure; said individual fibers having asymmetrical irregularly-shaped cross sections of sub-

stantially different profiles and sizes from one another when said assembly is cut at right angles to the longitudinal axes of the fibers at an arbitrary point therealong; at least 40% of the entire cross-sectional area of each fiber consisting of at least two different polymer phases which are coalesced side-by-side as at least two irregular blocks; and each of the individual fibers of said assembly having a non-uniform cross-sectional shape along its longitudinal axis.

14. A process for producing a fibrous assembly, the individual constituent fibers being interconnected at random in a spaced-apart relationship so that when spread in a direction at right angles to the longitudinal axes of the fibers, said assembly can form a continuous integral reticulated structure; said individual fibers having asymmetrical irregularly-shaped cross sections of substantially different profiles and sizes from one



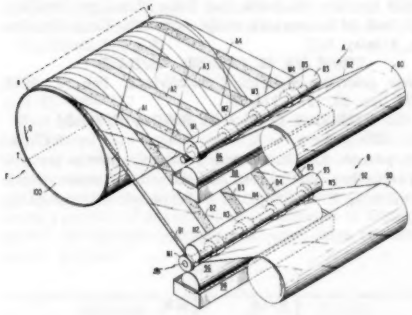
another when said assembly is cut at right angles to the longitudinal axes of the fibers at an arbitrary point therealong; at least 40% of the entire cross-sectional area of each fiber consisting of at least two different polymer phases which are coalesced side-by-side as at least two irregular blocks; and each of the individual fibers of said assembly having a non-uniform cross-sectional shape along its longitudinal axis; which comprises associating melts of at least two different foamable polymer phases in the form of layers, extruding the associated mass from an elongated slit having a narrow clearance of 30 to 300 microns as superimposed layer-like streams in the direction of the narrow width, simultaneously foaming the polymer phases, and taking up the extrudate at a draft ratio of from 50 to 250 while cooling the extrudate at a location between the slit exit and a point 10 mm below the exit.

4,288,485

TUBULAR INSULATING CURTAIN AND METHOD OF MANUFACTURE

Heikki S. Suominen, Petsamonk 14, Tampere, Finland

Filed Sep. 13, 1978, Ser. No. 942,087
Claims priority, application Finland, Mar. 21, 1978, 780877
Int. Cl.³ B65H *81/00*
U.S. Cl. 428—116 **5 Claims**



1. A method of manufacturing a selectively collapsible and expandable curtain having thermal insulating characteristics in its expanded state, said curtain having in its expanded state a predetermined width and a predetermined height and comprising a plurality of expandable tubes each extending along the width of the curtain, said method comprising the steps of:

a. winding about a forming member a continuous sheet of a flexible thin film material so as to form on said member a plurality of superimposed strips of said material, the forming member being chosen to have a peripheral length at least as long as said predetermined curtain width;

b. adheringly securing each said strip to the adjacent contacting strip on the forming member along a plurality of uniformly spaced longitudinally extending bands, said bands on successive adjoining layers being in staggered relationship such that a plurality of superimposed tubes are formed one atop the other on said forming member and a plurality of sets of said superimposed tubes are formed adjacent one another transversely across said forming member, each tube when fully expanded having a width substantially defined by a pair of opposing bands on upper and lower adjoining layers and a height substantially defined by upper and lower side sections comprised of the portions of said thin film material lying between said pair of opposing bands and a pair of transversely spaced bands joining said upper and lower adjoining layers on either side of said opposing bands;

c. continuing said winding step until the combined heights of said superimposed tubes in their fully expanded state are sufficient to provide substantially said predetermined curtain height, each of said tubes when fully expanded having a substantially rectangular cross-section with top and bottom walls defined by said opposing bands and sidewalls defined by said upper and lower side sections;

d. transversely cutting said superimposed strips to permit removal thereof from said forming member; and

e. cutting at least one intermediate set of said superimposed tubes longitudinally along said opposing bands to form at least two separate curtains each having said predetermined width and said predetermined height in its expanded state.

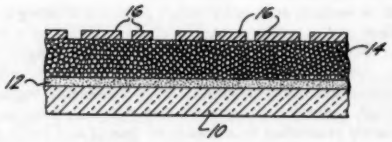
5. A thermal insulating curtain made in accordance with the method of claim **1**, **2**, **3** or **4**.

4,288,486

FLEXIBLE SHEET-TYPE COVERING MATERIAL AND PROCESS FOR MAKING SAME

George R. Ferment, Randolph, N.J., and Douglas C. Woerner, Northampton, Pa., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 36,605, May 7, 1979, Pat. No. 4,242,397.
This application Aug. 14, 1980, Ser. No. 178,051
Int. Cl.³ B32B *3/26*; B05D *3/12*
U.S. Cl. 428—141 **6 Claims**



1. Process for making decorative, flexible sheet type covering material comprising the steps of:

(a) coating at least one side of a flexible porous mat with a layer between about 10 and about 150 mils thick of mechanically frothed flexible foamed thermoplastic vinyl polymer;

(b) gelling and at least partially fusing the foamed layer; and

(c) then calendering the foamed layer at a temperature within the fusion temperature range of the vinyl polymer and at a nip pressure between about 2 and about 40 pounds per linear inch to thereby crush and consolidate the

foamed thermoplastic vinyl polymer so that no re-expansion of the foam occurs after crushing; wherein

(i) said mat has openings which average between about 2 and about 20 mils in the smallest linear dimension with at least about 50% of such openings having smallest linear dimensions between about 2 and about 10 mils; and

(ii) the foam as applied to the mat has a viscosity between about 3000 and about 25,000 cp.

4,288,487

METHOD OF FORMING SURFACE MARKINGS ON ROADWAY AREAS, AND ROADWAY AREAS PRODUCED THEREBY

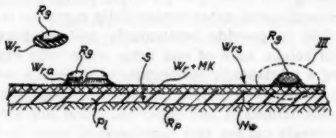
Ludwig Eigenmann, POB 8, CH 6833, Vacallo, Switzerland

Filed Mar. 22, 1979, Ser. No. 23,087

Claims priority, application Italy, Apr. 7, 1978, 22101 A/78

Int. Cl.³ B32B *5/16;* **E01F** *9/04*

U.S. Cl. 428—213 **16 Claims**



1. A method of forming a traffic regulating marking on a roadway area, comprising the steps of forming a traffic wear resistant later on a surface of a roadway area, which layer has a predetermined thickness and is constituted by a pigmented resin material, said traffic wear resistant layer having an outer face; providing a plurality of retroreflective globules having a minimum dimension which is a multiple of the thickness of said traffic wear resistant layer and an elongated major dimension; wetting said globules by a wetting resin material which is compatible with said pigmented resin material of said traffic wear resistant layer; and applying the globules which are wetted by said wetting resin material, onto said outer face of said traffic wear resistant layer, so that the elongated major dimensions of said globules wetted by said wetting resins are in contact with but not embedded in said outer face of said traffic wear resistant layer, and said wetting resin material forms, on said outer face in the region of each of said globules, a separate collar which individually connects each globule to said outer face of said traffic wear resistant layer.

10. A roadway area, comprising a pavement forming an area surface; and a traffic regulating marking including a traffic wear resistant layer secured to said surface and having an outer face, said traffic wear resistant layer having a predetermined thickness and being constituted by a hardenable pigmented material, a plurality of retroreflective globules contacting and upwardly protruding from said outer face of said traffic wear resistant layer, said retroreflective globules having a minimum dimension which is a multiple of the thickness of said traffic wear resistant layer and an elongated major dimension, said retroreflective globules being applied on said outer face of said traffic wear resistant layer so that the elongated dimension of said retroreflective globules are in contact with but not embedded in said outer face of said traffic wear resistant layer, and a wetting resin material which wets said globules before applying onto said outer face of said traffic wear resistant layer and forms a plurality of separate collars each extending upwardly from said outer face of said traffic wear resistant layer and individually connecting a respective one of said globules with said outer face of said traffic wear resistant layer.

4,288,488

LAMINATED PACKING MATERIAL WITH A HIGH GAS-IMPERMEABLILITY AND AN ADVANTAGEOUS WORKABILITY

Nobuyuki Hisazumi; Masataka Yamamoto, and Tsutomu Uehara, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 940,118, Sep. 6, 1978, Pat. No. 4,221,841. This application Jun. 22, 1979, Ser. No. 51,193

Claims priority, application Japan, Sep. 13, 1977, 52-109431; Fed. Rep. of Germany, Sep. 8, 1978, 2839083; Netherlands, Sep. 7, 1978, 7909130

The portion of the term of this patent subsequent to Sep. 9, 1997, has been disclaimed.

Int. Cl.³ B32B *7/02, 27/08, 9/04*

U.S. Cl. 428—214 **13 Claims**

1. A laminated material having high workability and gas-impermeability, prepared by laminating a layer of a copolymer of vinylidene chloride containing 3 to 10% by weight of a plasticizer having a molecular weight of less than 500 and a carrier layer of a synthetic resin carrying 5 to 70% by weight of at least one organic additive having a number average molecular weight in the range of 800 to 10,000 showing a melting point of lower than that of said copolymer of vinylidene chloride and selected from the group consisting of glycerides of higher saturated or unsaturated fatty acids or of higher saturated or unsaturated epoxidized fatty acids, rosin and derivatives thereof, oligomeric copolymers of styrene with isobutylene, butadiene or isoprene, oligomeric polyesters formed by polycondensation of an aliphatic dicarboxylic acid with 6 to 10 carbon atoms and a polyhydric alcohol with 2 to 6 carbon atoms and have a number average molecular weight of 1,000 to 2,000 and oligomeric epoxides formed by polycondensation of epichlorhydrin and bisphenol.

4,288,489

PROCESS FOR FLAMEPROOFING ORGANIC FIBROUS MATERIAL WITH PHOSPHONIC ACID SALTS

Hermann Nachbur, Dornach, and Peter Rohringer, Schönenbuch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

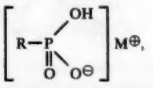
Filed Jan. 31, 1979, Ser. No. 8,217

Claims priority, application Switzerland, Feb. 6, 1978, 1279/78; Jan. 10, 1979, 214/79

Int. Cl.³ B32B *7/00;* **D04H** *1/58;* **B05D** *3/02;* **D06M** *9/00*

U.S. Cl. 428—265 **9 Claims**

1. A process for flameproofing organic fibrous material which comprises treating said material with an aqueous solution containing 25 to 500 g/l of a phosphonic acid salt of the formula



in which R is methyl or ethyl and $M^{\oplus}$ is an alkali metal cation or an ammonium cation, and drying it.

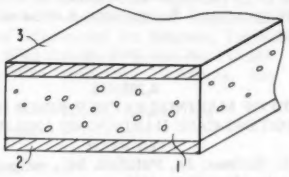
9. Fibrous material flameproofed according to claim 1.

4,288,490

ENGINE HOOD LINING FOR AUTOMOTIVE VEHICLES

Franz-Werner Alfter, Sieburg, and Hans-Ulrich Breitscheidel, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Mar. 16, 1976, Ser. No. 667,453
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2513705
Int. Cl.³ B32B *5/18;* E04B *1/74*
U.S. Cl. 428—315 1 Claim



1. An engine hood lining for an automotive vehicle which comprises a contoured, one-piece, molded composite panel adapted to cover struts extending across the inside portion of a hood of an automotive vehicle, said composite panel consisting of a closed-cell polyethylene foam material laminated on at least one side with a non-foamed polymer sheet and being shaped by molding to have a contour that fits the inside contour of the hood of the vehicle, said non-foamed polymer sheet being a heavy-weight sheet containing a mineral filler, said non-foamed polymer being a copolymer of ethylene and vinyl acetate containing 50–90% by weight of barium sulfate as the filler.

4,288,491

LAMINATED PLASTIC MATERIAL

Evgeny M. Surzhenko, ulitsa Shkolnaya, 8, kv. 7; Bronislav F. Basilaev, prospekt Tukhachevskogo, 37, kv. 66; Roman V. Molotkov, Vladimirsky prospekt, 7, kv. 23; Alexandr S. Madorsky, Piskarevsky prospekt, 40, kv. 273; Grigory B. Shalun, Zanevsky prospekt, 35, kv. 71; Valentina B. Golynkina, Piskarevsky prospekt, 48, kv. 5; Margarita A. Ershova, Tallinskaya ulitsa, 27, kv. 26; Irina P. Eliseeva, prospekt Energetikov, 30, korpus 1, kv. 383; Nina E. Trukhtenkova, prospekt K. Marxa, 72, kv. 51; Sergei M. Gurylev, Sestroretsk ulitsa Volodarskogo, 13, kv. 3; Diana L. Kopetskaya, naberezhnaya Fontanki, 90, kv. 5; Evgeny Y. Pechko, Krasnoe Selo, Fabrichny poselok, 4, kv. 7; Albert S. Khlamenko, Krasnoe Selo, Fabrichny poselok, 2, kv. 36, and Viktor V. Magnitsky, Krasnoe Selo, Fabrichny poselok, 5, kv. 17, all of Leningrad, U.S.S.R.

Filed Mar. 13, 1979, Ser. No. 20,080
Int. Cl.³ B32B *27/42, 23/06*
U.S. Cl. 428—332 7 Claims

7. A laminated material comprising surface layers of paper impregnated with amino-formaldehyde resin and inner layers of paper containing a flame retardant material in an amount of 4 to 8 percent by weight of the total laminate and impregnated with phenol-formaldehyde resin, said flame retardant material being a product of interaction of an aluminum or copper compound with phosphoric acid and nitrogen bases, containing, in weight percent:

P_2O_5 total	37 to 63
P_2O_5 water-soluble	0 to 6
NH_3	3.5 to 11
MO	18 to 43

where MO is at least one metallic oxide, said components of the laminated material being contained therein in the following ratio, in weight percent:

paper for surface layers	9 to 26
paper for inner layers	26 to 49
phenol-formaldehyde resin	16 to 30
amino-formaldehyde resin	5 to 26,

said laminated material having a combustibility index K in the range of 0.1 to 0.5, and a thickness of from 1 to 3 mm.

4,288,492

INSULATING COATING COMPOSITIONS APPLIED ON ELECTRICAL STEEL SHEETS

Yoshitaka Hiromae, Kitayushu; Kazuo Nakamura, Munakata; Toshiya Wada, and Hirotada Katoh, both of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 853,465, Nov. 21, 1977, abandoned, which is a continuation of Ser. No. 658,875, Feb. 18, 1976, abandoned. This application Feb. 4, 1980, Ser. No. 118,589
Claims priority, application Japan, Feb. 25, 1975, 50-23025
Int. Cl.³ B32B *15/08, 27/38*
U.S. Cl. 428—336 6 Claims

1. An electrical steel sheet coated with an insulating coating film said film having a thickness less than 10 microns and comprising 40 to 70 percent by weight of an organic polymeric material curable by ultraviolet rays or electron beam and 30 to 60 percent by weight of an inorganic compound selected from the group consisting of silicates having a hardness in Mohs scale of not higher than 5 and 1 to 50 percent by weight based on the total weight of the inorganic compound of a compound selected from the group consisting of boric acids and borates.

4,288,493

WATER-ACTIVATABLE CROSSLINKED ADHESIVE AND ENERGY CONTROL FILM MADE THEREWITH

James E. Kropp, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 16, 1979, Ser. No. 57,584
Int. Cl.³ C09J *7/02;* B32B *17/10*
U.S. Cl. 428—350 4 Claims

1. An energy control sheet comprising a transparent polymeric foil having bonded over one face a layer of water-activatable adhesive comprising in combination a blend of

(a) a polymeric substance selected from the class consisting of

(1) a copolymer of methyl vinyl ether and maleic anhydride and

(2) a half ester of said copolymer and

(b) a nonmetallic organic solvent-soluble crosslinking agent selected from the class consisting of

(1) polyfunctional epoxides and

(2) polyfunctional aziridines,

whereby when said adhesive is activated with water, said sheet is bonded to a windowpane to form a laminate, and said water is evaporated, the laminate thereafter possesses outstanding moisture resistance for extended periods of time but the sheet, after soaking in water, can be removed cleanly from the glass by simple hand pulling.

4,288,494

NON-UNIFORM CROSS-SECTIONAL AREA HOLLOW FIBERS

Christopher H. Porter, Newtown Square, and John A. Taylor, Furlong, both of Pa., assignors to Extracorporeal Medical Specialites, Inc., King of Prussia, Pa.

Filed Mar. 12, 1979, Ser. No. 19,973
Int. Cl.³ D02G *3/00*
U.S. Cl. 428—398 12 Claims

1. A semipermeable hollow fiber comprising cuprammonium regenerated cellulose, said fiber having a hollow core

extending continuously throughout the length thereof and having a non-uniform wall thickness and a non-uniform cross-sectional area, said fiber having along its length a first plurality of points of maximum outside diameter and a second plurality

of points of minimum outside diameter, said maximum outside diameters ranging from about twenty microns to about one thousand microns and said minimum outside diameters ranging from about 0.25 times the maximum outside diameter to about 0.9 times the maximum outside diameter.

4,288,495

ARTICLE COATED WITH BETA SILICON CARBIDE AND SILICON

Leslie L. Terner, West Bloomfield; Roy L. Van Alsten, Redford, and David Moskowitz, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 907,530, May 19, 1978, Pat. No. 4,226,914.
This application Feb. 4, 1980, Ser. No. 118,709
Int. Cl.³ B05D *1/08;* **B32B** *13/04, 9/04;* **C01B** *31/36*
U.S. Cl. 428—446 **3 Claims**

1. As a new article of manufacture,
a substrate and a tightly adherent coating on said substrate consisting essentially of beta silicon carbide and silicon.

4,288,496

SILICONE POLYMER-BASED RELEASE COATING AGENTS HAVING ORGANIC TITANATES AS STABILIZERS AND TAPES

Robert E. Reusser, and Brenton E. Jones, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 16, 1979, Ser. No. 3,824
Int. Cl.³ B32B *9/04*
U.S. Cl. 428—447 **15 Claims**

1. A coating composition suitable for use with an adhesive tape or film which comprises the following ingredients in parts by weight as follows:
low release strength silicone-based polymers
a. high wt. average molecular weight polymethyldihydroxysiloxanes, 3
b. low wt. average molecular weight polymethylhydrosiloxanes, 0.03–0.3
high release strength silicone-based polymer, 0.1–0.5
hydroxy terminated poly(conjugated diene)polymer, 0.01–0.25
organo titanate, 0.005–0.5
catalyst, 0.1–0.6
solvent, 20–200

8. A tape or film having thereon to prevent permanent sticking of an adhesive thereto a composition according to claim **1** from which the solvent had been removed.

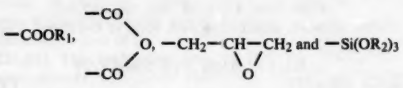
4,288,497

SILICONE-COATED ARTICLE AND PROCESS FOR PRODUCTION THEREOF

Mutsuhiro Tanaka, Ohtake, and Masatoshi Kashiwagi, Waki, both of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Jan. 14, 1980, Ser. No. 111,674
Claims priority, application Japan, Jan. 16, 1979, 54/3599
Int. Cl.³ B05D *3/02;* **B32B** *9/04, 13/12*
U.S. Cl. 428—447 **17 Claims**

1. A silicone-coated article having releasability imparted thereto by the coating of a silicone, wherein that surface of said article on which to coat the silicone is composed of a resin containing a polar group-containing olefinic resin comprising (a) 55 to 99% by weight of a unit derived from an olefin and (b) 1 to 45% by weight of a unit derived from a radical-polymerizable monomer containing a polar group selected from the class consisting of



in which R_1 represents a hydrogen atom, a metal capable of forming a salt with the carboxyl group, or a monovalent hydrocarbon group, and R_2 represents a monovalent hydrocarbon group.

4,288,498

METHOD OF MAKING LEATHER FIBER INSULATION BY DRYING-CASE HARDENING AND PRODUCT THEREOF

Herbert C. Scribner, Jr., Pittsfield, Me., assignor to Collagen Corporation, New York, N.Y.

Filed May 6, 1980, Ser. No. 147,462
Int. Cl.³ B32B *9/02, 9/04;* **C14B** *1/58*
U.S. Cl. 428—473 **14 Claims**

1. Pipe insulation material comprising case-hardened shredded tanned leather fibers of reduced hydroscopic tendency capable of taking up moisture only to a level of about 12% by weight or less over an eight hour period in an atmosphere of 100% humidity.

4. A method of converting tanned leather scrap into thermal insulation comprising the steps of:
(A) Shredding the tanned leather scrap into leather fibers without damaging the structural fiber integrity; and
(B) case hardening the shredded leather fibers by drying same to produce fibers of reduced hydroscopic tendency capable of taking up moisture only to a level of about 12% by weight or less over an eight hour period in an atmosphere of 100% humidity.

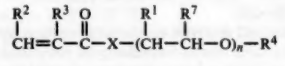
4,288,499

POLYMERS ADHERENT TO POLYOLEFINS

Andrew J. Kielbania, Jr., Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 8, 1979, Ser. No. 37,069
Int. Cl.³ B32B *27/08*
U.S. Cl. 428—518 **36 Claims**

1. An article comprising an untreated polyolefin substrate and adherent thereto a vinyl addition polymer of (1) monomers comprising at least 5% by weight a primary monomer selected from
(a) monomers having the formula



wherein
X is —O—, —NH— or —NR⁵—;
R^1 and R^7, individually, are H, methyl or ethyl;
R^2 is H, —COOH, —$CONH_2$, or —$COOR^6$,
R^3 is H, alkyl having up to 5 carbon atoms, —CH_2COOR^6, —$COOR^6$ or —CH_2COOH;
R^4 and R^5, individually, are monocyclic alkyl having 6 to 20 carbon atoms, acyclic alkyl having 9 to 20 carbon atoms, or alkaryl having 9 to 18 carbon atoms;
R^6 is hydrocarbyl; and
n having a value from zero to about ten;
(b) vinyl esters of alkanoic acids having 8 to 20 carbon atoms;

(c) Alkyl substituted styrene wherein the substituent group or groups have a total of 3 to 15 carbon atoms;

and mixtures thereof and optionally (2) or more substituted ethylene supplementary monomers; said polymer having surface energy properties such as to form a stable bond, having a 180° peel strength greater than 2 pounds per inch, with said substrate.

4,288,500

ELECTROCHEMICALLY ACTIVE ALUMINUM ALLOY AND COMPOSITE

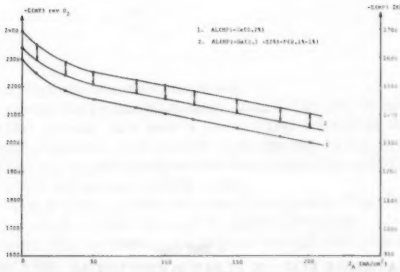
Budimir B. Jovanovic; Aleksandar R. Despic, both of Belgrade, and Dragutin M. Drazic, New Belgrade, all of Yugoslavia, assignors to Institute of Technical Sciences of the Serbian Academy of Sciences and Art, Belgrade, Yugoslavia

Filed Jan. 18, 1980, Ser. No. 113,184

Claims priority, application Yugoslavia, Aug. 28, 1979, 2098/79

Int. Cl.³ B32B *15/20*

U.S. Cl. 428—650 **5 Claims**



1. Electrochemically active aluminum alloy, characterized in that it consists essentially of, per 100 parts of weight of AL, 0.01–1 parts of weight of Ga and/or In, and in that it consists essentially of 0.01–1 parts of weight of P.

5. An article provided with an anti-corrosion protective coating of the electrochemically active aluminum alloy defined in claim **1**.

4,288,501

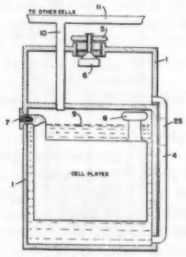
REUSABLE RESERVE BATTERY SYSTEM

Warren E. Moody, 95 Fiesta Way, Fort Lauderdale, Fla. 33301

Filed Feb. 7, 1980, Ser. No. 119,270

Int. Cl.³ H01M *2/40*

U.S. Cl. 429—70 **6 Claims**



1. Control valve actuated pneumatic means to evacuate electrolyte from a storage battery cell to an adjacent storage compartment and to return said electrolyte to said cell when desired comprising a storage compartment mounted over and adjacent to a battery cell, said storage compartment being connected to said cell by pipe means extending to a lower part of said cell, said storage compartment having a combination vent and float valve means activating a shut-off valve and a removable filler cap or plug, air pressure supply means piped to said control valve means thence into the top of said battery cell so that when said control valve is turned ON a supply of air under suitable pressure will be introduced into the top section of said cell thus forcing electrolyte downward and through said pipe means into said storage compartment until a level is reached sufficient to close said vent valve and stop further influx of electrolyte into said compartment and influx of air into said cell where maintenance of air pressure will keep electrolyte in said storage compartment until such time as said air control valve is turned OFF permitting said electrolyte to return to said cell under gravity and air pressure with the release of pressure in said cell.

4,288,502

PHOTO-ELECTROCHEMICAL CELL BATTERY

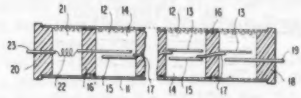
Yitzchak Avigal, Givataim; Joost Manassen, Rehovot; Gary Hodes, Rehovot, and David Cahen, Rehovot, all of Israel, assignors to Yeda Research & Development Co., Ltd., Rehovot, Israel

Filed Apr. 21, 1980, Ser. No. 141,795

Claims priority, application Israel, Apr. 22, 1979, 57109

Int. Cl.³ H01M *6/36*

U.S. Cl. 429—111 **21 Claims**



1. A battery comprising a plurality of photoelectrochemical cell arranged in series in an envelope adapted to permit solar energy to pass therethrough, each of said cells comprising a photoelectrode, a counterelectrode, and an electrolyte, the photoelectrode and counterelectrode of each cell being attached to and forming electrical contact with conductive means; said battery further comprising at least one separation means for separating each of said cells from one another so as to form a liquid-tight fit within said envelope whereby each of said cells is liquid tight.

20. A battery comprising a plurality of photoelectrochemical cells arranged in series in an envelope, said envelope being adapted to permit solar radiation to pass therethrough, each of said cells comprising a photoelectrode, a counterelectrode, and an electrolyte, the photoelectrode and counterelectrode of each cell being attached to and forming electrical contact with conductive means; said battery further comprising at least one separation means for separating each of said cells from one another, said separation means comprising means for compensating for volumetric changes within each of said cells.

4,288,503

LAMINATED MICROPOROUS ARTICLE

Bruce S. Goldberg, Clifton, N.J., assignor to Amerace Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 915,916, Jun. 16, 1978, Pat. No. 4,201,838. This application May 24, 1979, Ser. No. 41,511

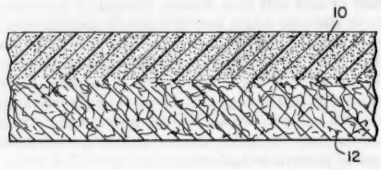
The portion of the term of this patent subsequent to May 6, 1997, has been disclaimed.

Int. Cl.³ H01M *2/16*

U.S. Cl. 429—145 **9 Claims**

1. As an article of manufacture, a laminated microporous article combination comprising a first layer of microporous material, wherein the micropores are substantially all of a size of about 2 microns and less and a layer thickness of 2 mils and greater and a second layer of porous backing material laminated to said first layer, said second layer comprising a heat-

bonded fibrous polyester non-woven web of a thickness of about 8 mils and greater and an electrical resistance, in a battery acid electrolyte, of about 0.25 mΩ in^2/mil, said laminate having a total thickness of about 10 to 40 mils for a backweb of a microporous layer and said backing material, said non-woven



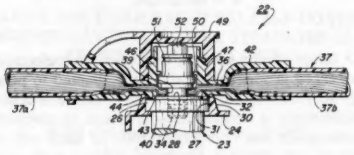
web having a grab breaking strength of 20 to 30 lbs. in machine direction and 12 to 18 lbs in cross direction, a grab breaking elongation, from 25 to 50 percent in machine direction and 50 to 120 percent in cross direction, with a Mullen burst value of 30 to 40 lbs.

4,288,504

SEALED BATTERY CABLE TERMINATION

Victor J. Julian, 2400 Belvue, Westchester, Ill. 60153, and Kenneth A. Julian, 409 Suffolk La., Oak Brook, Ill. 60521

Filed Jul. 21, 1980, Ser. No. 170,846
Int. Cl.³ H01M *2/30*
U.S. Cl. 429—179 **8 Claims**



1. In combination,
a storage battery having a wall formed of an insulating material having a hole therethrough,
a metallic terminal extending through said hole in sealing relationship with said wall,
said terminal having a cylindrical portion on the external side of said wall,
an upstanding flange on said wall surrounding said cylindrical portion and extending outwardly beyond the distal end of said terminal,
said terminal having a centrally disposed cylindrical boss defining with said flange an annular open top groove surrounding said boss,
said terminal having an internally threaded, axial blind hole opening onto said distal end, an electric cable having a terminal connector affixed thereto,
said terminal connector including,
a terminal plate having an opening therethrough in alignment with said hole in said terminal,
said terminal plate having a depending annular portion surrounding said opening and abutting said distal end of said terminal,
a plastic, insulating cover molded directly over said terminal plate and having an annular, resilient lip portion extending into said groove, and
a terminal bolt extending through said opening and threaded into said hole and holding said terminal plate in contact with said distal end of said terminal and said lip in compression in said groove.

4,288,505

HIGH ENERGY DENSITY SOLID STATE CELL

Ashok V. Joshi, Fishkill, N.Y., and William P. Sholette, Warminster, Pa., assignors to Ray-O-Vac Corporation, Philadelphia, Pa.

Filed Oct. 24, 1980, Ser. No. 200,275
Int. Cl.³ H01M *6/18*
U.S. Cl. 429—191 **5 Claims**

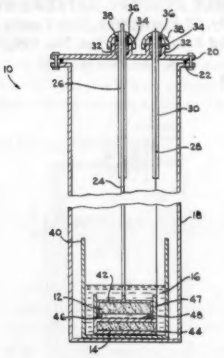
1. A solid state lithium electrochemical cell having a lithium anode, a solid state electrolyte capable of lithium-ion transport, having a high electronic resistivity and selected from the group of lithium nitride, lithium sulfide, lithium metaborate and lithium iodide in contact with said lithium anode and a cathode, separated from said lithium anode by said electrolyte, comprising at least one high energy denisty compound reactive with said electrolyte and separated from said electrolyte by a stable, in-situ formed, self-healing layer of electrolytically conductive reaction product of said electrolyte and said cathode material, said anode and said cathode being in electrolytically conductive contact through said electrolyte and said in-situ formed, self-healing layer.

4,288,506

CATHODE FOR AN ELECTROCHEMICAL CELL AND AN ELECTROCHEMICAL CELL

Johan Coetzer, and Michael M. Thackeray, both of Pretoria, South Africa, assignors to South African Inventions Development Corp., Pretoria, South Africa

Filed Sep. 5, 1979, Ser. No. 72,762
Claims priority, application South Africa, Sep. 22, 1978, 78/5392; Mar. 21, 1979, 79/1359; Apr. 11, 1979, 79/1739
Int. Cl.³ H01M *4/04, 4/58, 4/66*
U.S. Cl. 429—199 **25 Claims**

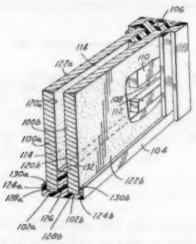


1. A cathode for an electrochemical cell, the cathode comprising as the electrochemically active material an intermediate refractory hard metal compound of at least one metal selected from the group consisting of chromium, manganese, iron, cobalt and nickel, with at least one non-metal selected from the group consisting of carbon, boron, nitrogen, silicon and phosphorus, which has been activated by halogenation.

4,288,507
CONTROL OF EDGE EFFECTS OF OXIDANT ELECTRODE

Peter Carr, Utica, and Chen H. Chi, Sterling Heights, both of Mich., assignors to Energy Development Associates, Inc., Madison Heights, Mich.

Division of Ser. No. 62,109, Jul. 30, 1979, Pat. No. 4,241,150.
This application Jul. 21, 1980, Ser. No. 170,795
Int. Cl.[3] H01M 4/02
U.S. Cl. 429—209 6 Claims



1. An electrode assembly comprising:

a. a porous electrode (**40**) having a first (**122***a*) and second (**122***b*) exterior face with a cavity (**114**) formed in the interior between said exterior faces thereby having first (**120***a*) and second (**120***b*) interior faces positioned opposite the first and second exterior faces;

b. a counter electrode (**68**) positioned facing each of the first and second exterior faces of the porous electrode;

c. means (**83**) for passing an oxidant through said porous electrode; and

d. screening means (**126**) for blocking the interior face of the porous electrode a greater amount than the blocking (**124***a* and **124***b*) of the respective exterior face of the porous electrode, thereby maintaining a differential of oxidant electrode surface between the interior face and the exterior face.

4,288,508
CHALCOGENIDE ELECTROCHEMICAL CELL

Samarnath Basu, Philadelphia, and Wayne L. Worrell, Narberth, both of Pa., assignors to University Patents, Inc., Norwalk, Conn.

Division of Ser. No. 943,107, Sep. 18, 1978, Pat. No. 4,206,276.
This application Dec. 4, 1979, Ser. No. 100,043
Int. Cl.[3] H01M 4/58
U.S. Cl. 429—218 11 Claims

1. An electrochemical cell in the charge state, said cell having a cathode-active material, an anode-active material and an electrolyte, wherein the cathode-active material is an alkali metal comprising a partially alkali metal intercalated dichalcogenide of the formula A_yMZ_x wherein

A is an alkali metal more electropositive than the anode active material;

M is at least one transition metal of Group IV or V;

Z is selenium, sulfur or tellurium;

y is a numerical value from about 0.01 to about 1;

x is a numerical value from about 1.8 to about 2.1; and,

the anode-active material is an alkali metal.

7. An electrochemical cell in the charge state, said cell having a cathode-active material, an anode-active material and an electrolyte, wherein the cathode-active material is a metal intercalated dichalcogenide of the formula A_yMZ_x wherein

A is a metal selected from the group consisting of Be, Mg, Ba, Ca and Sr and is more electropositive and larger than the anode-active material;

M is at least one transition metal of Group IV or V;

z is selenium, sulfur or tellurium;

y is a numerical value from about 0.01 to about 1; and

x is a numerical value from about 1.8 to about 2.1.

4,288,509
RECORDING MATERIAL

Takashi Kashiwagi, Tachikawa, Japan, assignor to Process Shizai Co., Ltd., Tokyo, Japan

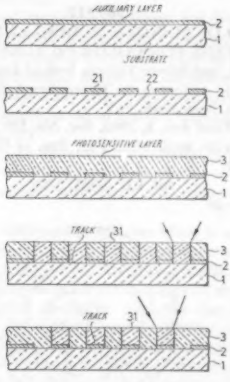
Filed Jul. 20, 1979, Ser. No. 59,369
Claims priority, application Japan, Jul. 21, 1978, 53-88276
Int. Cl.[3] G03C 5/00, 5/24
U.S. Cl. 430—5 1 Claim

1. A process for forming a photomask which comprises flash exposing in heat conducting relation with an original a thermal recording material comprising a transparent support having formed thereon a recording layer containing a thermally coagulatable proteinaceous compound, wherein a coloring material is present in said recording layer in an amount such that said recording layer has an average optical density in the wavelength region of 350 nm to 450 nm of at least about 1.5, and removing the portions of the recording layer in the thermal recording material which have not been rendered insoluble by said flash exposing, whereby an image is formed in said recording layer.

4,288,510
PROCESS OF MAKING AN OPTICALLY RECORDABLE AND READABLE INFORMATION CARRIER AND THE CARRIER OBTAINED BY THIS PROCESS

Claude Tinet, and Claire Lemonon, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Division of Ser. No. 42,450, May 25, 1979, Pat. No. 4,252,889, which is a continuation of Ser. No. 835,282, Sep. 20, 1977, abandoned. This application Sep. 22, 1980, Ser. No. 189,222
Claims priority, application France, Sep. 24, 1976, 76 28771
Int. Cl.[3] G03C 5/04, 1/76; G01D 15/24
U.S. Cl. 430—11 3 Claims



1. An optically readable video disc or tape for use in an information storage system of the type comprising optical means for producing a focussed reading radiation beam to be projected onto said video disc or tape, and servocontrol means for maintaining said optical means and said video disc or tape in proper registry, said video disc or tape carrying prerecorded elements of information and comprising:

a substrate;

a radiation sensitive layer covering said substrate;

an auxiliary layer covering said radiation sensitive layer and comprising a continuous recording track formed by a smooth groove in said auxiliary layer exposing a continuous track of said radiation sensitive layer following a predetermined configuration,

said continuous track being optically trackable by said optical servocontrol means; and

said pre-recorded elements of information being recorded along said continuous track in said radiation sensitive layer by the formation of optically detectable structural changes therein and being read by optically modulating said focussed reading radiation beam by the structural changes corresponding to said pre-recorded elements of information,

said continuous track and said information being distinctly detectable by optical reading means sensitive to said optical-structural changes, and

said track being detectable even in the absence of recorded information.

4,288,511

PHOTOGRAPHIC ELEMENTS CONTAINING ENCAPSULATED POLYMERS COORDINATED WITH METAL IONS

Drewfus Y. Myers, Jr., Pittsford, and George H. Hawks, III, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 22,676, Mar. 22, 1979. This application Apr. 29, 1980, Ser. No. 144,808

Int. Cl.³ G03C *1/40, 1/10, 5/54;* C08K *9/00*

U.S. Cl. 430—17 **9 Claims**

7. A photographic element comprising a dye mordant containing-layer containing a hydrophilic vehicle having dispersed therein a non-metal chelating particulate polymeric dye mordant encapsulated with a metal chelated with a chelating polymer and containing a dye or dye-forming material, imagewise.

4,288,512

METHOD OF MANUFACTURING LUMINESCENT SCREENS FOR COLOR PICTURE TUBES

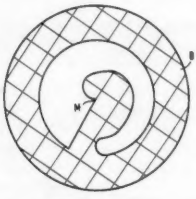
Bruno Fischer, and Rainer Vollath, both of Esslingen, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 3, 1980, Ser. No. 109,388

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1979, 2902233

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—24 **2 Claims**



1. A method of manufacturing luminescent screens for colorpicture tubes comprising the steps of:

coating the faceplate with a light sensitive layer of luminescent material,

exposing the faceplate to light through a shadow mask by means of a pencil of light rays from a light source,

inserting a diaphragm having an aperture of radially increasing width in the path of said light rays, and

rotating said diaphragm at a rate of approximately 100-200 revolutions per minute so that the amount of light reaching said faceplate increases from the center to the outside edge.

4,288,513

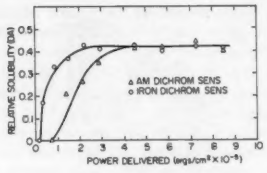
PHOTORESIST OF POLYVINYL ALCOHOL AND FERRIC DICHROMATE

Kurt B. Kilichowski, N. Framingham; Peter Cukor, Natick, and Charles Brecher, Lexington, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 734,897, Oct. 22, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,547

Int. Cl.³ G03C *5/00, 1/68*

U.S. Cl. 430—28 **11 Claims**



1. A method of enhancing the sensitivity of a cross-linkable poly(vinyl alcohol)photoresist to radiation in the visible region of the spectrum comprising incorporating a ferric dichromate into a cross-linkable poly(vinyl alcohol) photoresist-forming composition thereby enhancing the absorptive sensitivity of the photoresist in the visible region of the spectrum.

4,288,514

METHOD FOR CONTROLLING IMAGE FORMATION IN ELECTROPHOTOGRAPHY BY PRE-EXPOSURE STEP

Noboru Kutsuwada, Tokyo; Minoru Saito, Hachioji; Ryoichi Namiki, Hino, and Katsuo Kusunoki, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 490,055, Jul. 19, 1974, abandoned, which is a continuation of Ser. No. 57,732, Jul. 23, 1970, abandoned. This application Sep. 7, 1977, Ser. No. 831,263

Claims priority, application Japan, Jul. 28, 1969, 44-59014

Int. Cl.³ G03G *13/22, 13/24*

U.S. Cl. 430—54 **6 Claims**

1. In a repetitive electrophotographic process including the steps of applying a primary charge of a predetermined polarity to a reusable photosensitive member having a photoconductive layer and an overlying insulating surface layer; discharging or applying a secondary charge having a component of a polarity opposite to said predetermined polarity to the photosensitive member, and substantially simultaneously therewith, exposing the photosensitive member to imaging light; then uniformly exposing the surface of the photosensitive member to light to form an electrostatic latent image on the photosensitive member; thereafter utilizing the electrostatic latent image; and thereafter sequentially repeating the process steps using the photosensitive member to form and utilize a plurality of electrostatic latent images, the improvement comprising the steps of:

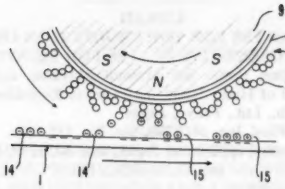
uniformly applying light to the surface of the photosensitive member which is to be exposed to the image light at least before initiation of the application of primary charge to the photosensitive member for a first image formation in a continuous sequence of image forming operations; and

uniformly applying light of an intensity lower than that of the initial uniform light application to said surface of the photosensitive member before the initiation of primary charge application for a subsequent image formation in the sequence of image forming operations.

4,288,515
PROCESS FOR REVERSAL DEVELOPMENT USING INDUCTIVELY CHARGEABLE MAGNETIC POWDERY DEVELOPER

Keitaro Yamashita, and Kohji Noguchi, both of Saitama, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jun. 28, 1978, Ser. No. 919,999
Claims priority, application Japan, Jul. 6, 1977, 52-79925
Int. Cl.³ G03G *13/09, 13/22*
U.S. Cl. 430—100 4 Claims



1. A reversal developing process for developing an electrostatic latent image on a surface, the latent image being in the form of first charged areas and second lesser charged areas in which the potential of the first charged areas is substantially more in absolute value than that of the second charged areas, the potential of the first charged areas being of a given polarity, the process comprising:

forming a first toner brush with inductively chargeable ferromagnetic toner on a first shell by a magnetostatic attraction force caused by a permanent magnet member incorporated within the shell;

subjecting the first toner brush to the electrostatic force of the charged areas for adhering the toner as a layer on the first charged areas of the surface;

charging with a D.C. charger the toner layer adhering to the first areas and recharging the second areas both with a uniform amount of charge of the same polarity as the potential of the first areas;

damping the electrostatic charge on the first charged areas by dark decay and neutralization by the toner layer;

forming a second toner brush with inductively chargeable ferromagnetic toner on a second shell by a magnetostatic attraction force caused by a permanent magnet member incorporated within the shell; and

interpositioning the second toner brush and the surface for subjecting the second toner brush to the electrostatic force of the toner layer on the first charged areas and the electrostatic force of the second charged areas for magnetically removing the previously adhered toner and adhering toner on the second recharged areas in a single pass of the second toner brush.

4,288,516
POLYESTER RESIN CONTAINING MAGNETIC TONER MATERIAL AND PROCESS FOR ITS USE IN FLASH FUSER

Stephen L. Gaudioso, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 28, 1980, Ser. No. 115,974
Int. Cl.³ G03G *9/14*
U.S. Cl. 430—107 10 Claims

1. A single component magnetic toner comprised of from about 25 percent to about 50 percent by weight of a resin which is selected from the polymeric esterification condensation products of 2,2 bis (4-hydroxy-isopropoxy-phenyl)-propane and fumaric acid, 2,2 bis (4-hydroxy-isopropoxy-phenyl)-propane and 2,2-dimethyl fumaric acid, 2,2 bis (4-hydroxy-butoxy-phenyl)-propane and fumaric acid, 2,2 bis (4-hydroxy-butoxy-phenyl)-propane and 2,2-dimethyl fumaric acid, or 2,2 bis (4-hydroxy-ethoxy phenyl)-propane and fumaric acid, and from about 50 percent to about 75 percent of magnetite.

4,288,517
TONER FOR ELECTROSTATIC PHOTOGRAPHY CONTAINING RESIN COATED SILICA PARTICLES

Seiji Arimatsu; Katsukiyo Ishikawa; Yasusi Umeda, and Koichi Nagata, all of Neyagawa, Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed May 14, 1980, Ser. No. 149,834
Claims priority, application Japan, Sep. 21, 1979, 54/122385
Int. Cl.³ G03G *9/10*
U.S. Cl. 430—110 8 Claims

1. A toner composition for electrostatic photography which comprises (A) toner powder comprising a base resin and a coloring agent and having an average particle size of not more than 30 microns and (B) silica powder coated on its surface with the base resin of the toner powder.

4,288,518
ELECTROGRAPHIC MAGNETIC DEVELOPING METHOD

Osamu Miyamoto, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed Nov. 26, 1979, Ser. No. 97,547
Claims priority, application Japan, Dec. 13, 1978, 53-154836; Dec. 19, 1978, 53-158020
Int. Cl.³ G03G *13/09*
U.S. Cl. 430—122 5 Claims

1. In a method of repetitively developing latent electrostatic images comprising:

a first step of stirring a developer containing toner particles and carrier granules having magnetic properties to triboelectrically charge the toner particles to a polarity suitable for developing a latent electrostatic image on an image-bearing surface and

a second step of causing a developer bearing member to attract the developer in the form of a magnetic brush and bringing said magnetic brush into rubbing contact with the latent electrostatic image on said image-bearing surface to electrostatically attract the toner particles thereto from said magnetic brush to convert the latent image to a visible image and

wherein there is an increase or a decrease in the degree of attraction of the toner particles to the latent image as the developing method is repeated, the improvement which comprises

a third step of determining whether there is an increase or decrease in the degree of attraction of the toner particles to the latent image as the developing method is repeated and if there is an increase in the degree of attraction, then replenishing the developer used for the development which contains a reduced quantity of toner particles, with toner particles having higher triboelectric chargeability than the toner particles contained in the developer before development and if there is a decrease in the degree of attraction, then replenishing the developer used for development which contains a reduced quantity of toner particles, with toner particles having lower triboelectric chargeability than the toner particles contained in the developer before development; the toner particles to be replenished and the toner particles contained in the developer being triboelectrically chargeable to the same polarity by frictional contact with the carrier granules contained in the developer; the size of said toner particles supplied in said third step being approximately equal in size to the toner particles contained in the developer,

wherein said toner particles to be supplied in said third step and said toner particles initially contained in the developer before the development respectively contain a charge-controlling agent in different proportions,

whereby the degree of attraction of the toner particles to the

latent image upon repeated development becomes more uniform.

4,288,519

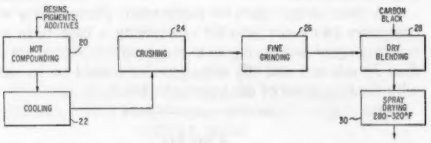
DUAL PURPOSE ELECTROPHOTOGRAPHIC MAGNETIC TONER AND PROCESS OF MAKING

Arthur S. Diamond, Ventura, and Sydney N. Floersheim, Encino, both of Calif., assignors to Black Copy Company, Inc., Canoga Park, Calif.

Division of Ser. No. 772,502, Feb. 28, 1977. This application Dec. 20, 1977, Ser. No. 862,613

Int. Cl.[3] G03G *9/08;* **B28B** *11/06*

U.S. Cl. 430—137 **9 Claims**



1. A method of producing a dual purpose, single component, electronically conductive, magnetically attractable toner comprising the steps of:

heating and mixing a mixture of thermoplastic toner resins to form an intimate blend while dispersing therein 50 to 150 phr of finely divided, magnetic pigment and 0 to 15 phr of conductive pigment, said resins consisting essentially of a linear polyester consisting of the condensation product of an aromatic diol with an unsaturated aliphatic, dibasic acid having a softening point from 95° C. to 115° C. and an ethylene-vinyl acetate copolymer containing 5 to 40% vinyl acetate and the ratio of polyester to copolymer being from 1:1 to 5:1;

cooling the mixture to a brittle solid;

breaking the mixture into large fragments;

grinding the fragments to form coarse particles;

fine grinding the coarse particles to form fine, fragmentary aspherical, acicular particles having a diameter from 10 to 40 microns by subjecting the particles to jets of inert gas in absence of abrasive such that they fragment by self-impact;

dry blending the fine particles with from 0.5 to 2.0 percent by weight of finely divided conductive pigment having a particle diameter in the range of 10–80 milimicrons; and

embedding the conductive pigment on the surface of the fine, acicular, aspherical particles without changing the shape thereof by gravity feeding the dry blend into the top of a spray drier and heating the falling particles in a 250°–350° F. gas stream to a temperature just sufficient to soften the thermoplastic resin.

4,288,520

PROCESS OF MANUFACTURING LIGHT-SENSITIVE COPYING MATERIAL BASED ON DIAZONIUM SALT CONDENSATION PRODUCTS

Gerhard Sprintschnik, Hofheim, and Fritz Uhlig, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 30, 1979, Ser. No. 62,026

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2834059

Int. Cl.[3] G03C *1/54, 1/71, 1/74, 1/94*

U.S. Cl. 430—169 **6 Claims**

1. In a process for the manufacture of a negative-working, presensitized planographic printing plate developable in pure water at room temperature by applying an aqueous coating mixture without any addition of organic solvent to an aluminum plate support and drying the coating, said coating mixture containing

(a) a water-soluble light-sensitive condensation product of an aromatic diazonium salt,

(b) a stable dispersion of a water-insoluble macromolecular polymer, and

(c) about 0.01 to 0.6 part by weight of a surface-active agent per part by weight of the water-insoluble polymer, over and above the amount of surface-active agent required to manufacture and stabilize the dispersion,

the improvement which comprises drying the coating mixture at a temperature between about 45° C. and the decomposition temperature of the diazonium compound and under conditions such that an optically homogeneous light-hardenable coating with no discrete particles visible at 30,000-fold magnification is formed.

4,288,521

PROCESS FOR THE PRODUCTION OF PHOTOSENSITIVE PLATES FOR PRINTING

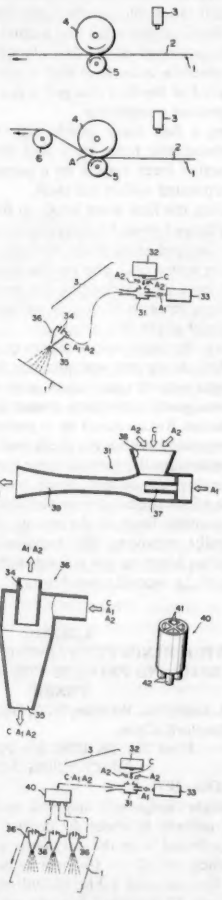
Hiroshi Kojima; Kunio Ito; Masami Akiyama, and Takeshi Tanaka, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1980, Ser. No. 115,122

Claims priority, application Japan, Jan. 30, 1979, 54/9818

Int. Cl.[3] G03C *1/76*

U.S. Cl. 430—169 **6 Claims**



1. A process for the production of a photosensitive plate for printing which comprises:

feeding a volume of air containing a given amount of a fine powder having a constant directional size of 0.5–40μ to at least one cyclone;

downwardly discharging from the bottom of said cyclone said given amount of said fine powder together with a volume of air which is small relative to the volume of air fed to said cyclone; and

uniformly dispersing and adhering the discharged fine powder onto the surface of the side of a photosensitive plate which contains a photosensitive layer which is continuously moving past said cyclone.

4,288,522

NON-PHOTOSENSITIVE RECEPTOR MATERIAL SUITED FOR PRODUCING BLACK-AND-WHITE SILVER IMAGES AND DYE IMAGES AND A PROCESS FOR THE PRODUCTION OF SUCH IMAGES THEREWITH

Frans Carael, Edegem; Daniël A. Claeys, Mortsel, and Wilhelmus Janssens, Aarschot, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Jan. 22, 1980, Ser. No. 114,082

Claims priority, application United Kingdom, Jan. 24, 1979, 02551/79

Int. Cl.³ G03C *5/54, 1/40, 1/48*

U.S. Cl. 430—213 **11 Claims**

1. A non-photosensitive receptor material free from silver halide adapted for use in a dye transfer and silver complex diffusion transfer process, said material including:

(i) a support,

(ii) a first organic hydrophilic colloid layer containing an organic onium compound capable of mordanting an acid dye, and

(iii) a transparent second organic hydrophilic colloid layer containing development nuclei for catalyzing the reduction of silver complex salts to silver;

said material containing at least one organic compound having an anionic group linked to a carbon atom in said layer (iii) and/or in a hydrophilic colloid interlayer consisting essentially of a hydrophilic organic colloid binder and said organic compound which is situated between said layers (ii) and (iii).

4,288,523

DIFFUSION CONTROL LAYERS IN DIFFUSION TRANSFER PHOTOGRAPHIC PRODUCTS

Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 14, 1980, Ser. No. 130,527

Int. Cl.³ G03C *1/40, 1/48, 5/54*

U.S. Cl. 430—215 **39 Claims**

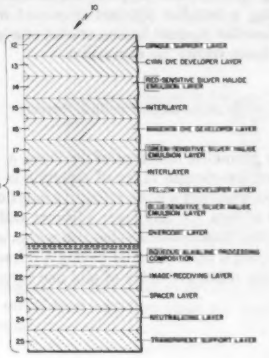
1. A photographic diffusion transfer film unit comprising:

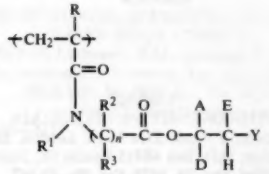
a support layer;

a photosensitive silver halide emulsion layer having associated therewith a diffusion transfer process image-providing material;

an alkaline processing composition permeable image-receiving layer; and

at least one diffusion control layer comprising a polymer having recurring units of the formula





wherein R is hydrogen or lower alkyl; R^1 is hydrogen or lower alkyl; R^2 and R^3 are independently hydrogen, lower alkyl, substituted lower alkyl, aryl, alkaryl, aralkyl, cycloalkyl, or R^2 and R^3 together with the carbon atom to which they are bonded constitute a carbocyclic or heterocyclic ring, or R^3, when substituted on the methylene carbon atom next adjacent the nitrogen atom, is taken together with R^1 to form part of a substituted or unsubstituted N-containing ring; A, D, and E are selected from the group consisting of hydrogen, methyl, and phenyl, provided that no more than one of A, D, or E may be methyl or phenyl; Y is a β-elimination activating group; and n is a positive integer one to six.

4,288,524

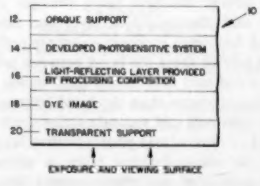
IMAGE-RECEIVING ELEMENTS UTILIZING LAMELLAR PIGMENT MATERIALS

Ruth C. Bilofsky, Lexington, and Howard G. Rogers, Weston, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 921,186, Jul. 3, 1978, Pat. No. 4,216,018, which is a continuation-in-part of Ser. No. 744,598, Nov. 24, 1976, abandoned. This application May 27, 1980, Ser. No. 153,590

Int. Cl.³ G03C *5/54, 1/40, 1/84*

U.S. Cl. 430—220 **16 Claims**



1. An image-receiving element for a diffusion transfer prod-

uct which comprises a support carrying an image-receiving layer and a substantially white layer positioned between said image-receiving layer and said support, said substantially white layer comprising a lamellar pigment dispersed in a matrix material, said lamellar pigment having at least one layer with a geometric thickness within the expression:

$$T = \frac{\lambda}{4} /n \text{ (or an odd multiple thereof)}$$

where: T is the geometric thickness of the layer, λ represents a wavelength or wavelength range of radiation in the visible region of the spectrum and n is the refractive index of the layer material and is at least 1.7; any layer adjacent said one layer having a geometric thickness of a value also within said expression but comprising a layer material having a refractive index different from the refractive index of said one layer.

4,288,525

PHOTOSENSITIVE MATERIALS

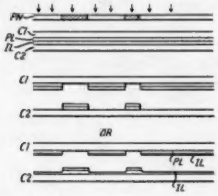
John V. Shepherd, 7 Apple Tree Yard, London, England, and Eric M. Sutton, P.O. Box 45315 Pemba St., Nairobi, Kenya

Filed Aug. 24, 1979, Ser. No. 69,367

Claims priority, application United Kingdom, Aug. 24, 1978, 34531/78

Int. Cl.³ G03C *11/12, 1/76*

U.S. Cl. 430—253 **14 Claims**



1. A photosensitive material comprising

a light transmitting first carrier sheet,

a photosensitive layer comprising at least one member selected from the group consisting of photopolymerizable compositions, photocrosslinkable compositions and mixtures thereof on said first carrier,

an image-forming non-photosensitive layer on said photosensitive layer, and

a second carrier sheet in contact with the free surface of said image-forming layer,

the bond between said second carrier sheet and said image-forming layer prior to exposure of said photosensitive layer to actinic radiation being stronger than the bond between said photosensitive layer and said first carrier sheet and, following exposure to actinic radiation through said first carrier sheet the bond between said photosensitive layer and said first carrier sheet in the light exposed areas being stronger than the bond between said image-forming layer and said second carrier sheet, and

the exposed portion of said photosensitive layer and at least part of said image-forming layer in contact with said exposed portion of said photosensitive layer are removable along with said first carrier sheet on separating said first and second carrier sheets after imagewise exposure.

4,288,526

LIGHT-SENSITIVE PRINTING PLATES WITH DISCONTINUOUS OVER-COATING

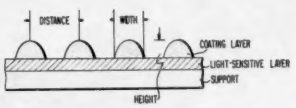
Kazutaka Oda, and Yoshio Okishi, both of Yoshida, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 878,355, Feb. 16, 1978, which is a continuation of Ser. No. 659,447, Feb. 19, 1976, abandoned. This application Jan. 9, 1980, Ser. No. 110,740

Claims priority, application Japan, Feb. 19, 1975, 50-20620; Mar. 24, 1975, 50-35940

Int. Cl.³ G03C *1/76*

U.S. Cl. 430—272 **5 Claims**



1. A light-sensitive printing plate precursor comprising a support having coated thereon, in order, a light-sensitive layer and an outermost layer comprising an uneven pattern of a discontinuous coating layer consisting of coated areas and uncoated areas, the height of the coated areas being about 2 to 40 microns, and the distance between the coated areas adjacent to each other is about 50 to 100,000 microns, said outermost layer being substantially entirely removed upon development of said light-sensitive layer.

4,288,527

DUAL UV/THERMALLY CURABLE ACRYLATE COMPOSITIONS WITH PINACOL

Charles R. Morgan, Brookeville, Md., assignor to W. R. Grace & Co., New York, N.Y.

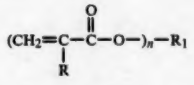
Filed Aug. 13, 1980, Ser. No. 177,658

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—288 **4 Claims**

1. A dual UV radiation and heat activitable composition consisting essentially of

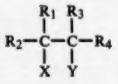
(1) a liquid ethylenically unsaturated compound of the formula:



wherein R is H or CH_3, R_1 is an organic moiety and n is 2 to 4,

(2) 0.0005 to 30% by weight of (1) of a photoinitiator, and

(3) 0.01 to 5% by weight of (1) of a substituted or unsubstituted pinacol of the general formula:

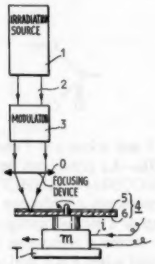


wherein $R_1$and R_3 are members independently selected from the group consisting of substituted and unsubstituted aromatic radicals, R_2 and R_4 are members independently selected from the group consisting of substituted and unsubstituted aliphatic and aromatic radicals and X and Y are members independently selected from the group consisting of hydroxyl, alkoxy and aryloxy.

4,288,528
METHOD OF MAKING AN EMBOSSED PATTERN ON AN INFORMATION BEARING SUBSTRATE

Jean E. Picquendar; Michel Marchal; Jean C. Dubois, and Eugene Duda, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 874,840, Feb. 8, 1978, abandoned, which is a continuation of Ser. No. 663,789, Mar. 4, 1976, abandoned, which is a continuation of Ser. No. 433,406, Jan. 14, 1974, abandoned. This application Jun. 11, 1979, Ser. No. 47,219
Claims priority, application France, Jan. 18, 1973, 73 01746
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—297 **10 Claims**



1. A process for optically recording video frequency signals as an embossed pattern on the flat surface of a disc forming a substrate comprising:

(a) coating upon said flat surface a layer of photoresist material having a thickness at least equal to the depth of the resulting embossed pattern, the coated photoresist layer adhering to said flat surface;

(b) depositing upon said layer a film of residue-free, evaporable material having a thickness sufficient for masking said layer against actinic radiation, said film adhering to said layer of photoresist material;

(c) irradiating said film in situ along the prospective embossed areas of said pattern with a focussed writing beam from a coherent light source, said irradiation selectively evaporating said film from said area thereby opening holes in said film;

(d) irradiating said layer of photoresist material in situ through the thus opened holes in said film with actinic radiation;

(e) selectively dissolving said photoresist layer to remove the irradiated portions of said photoresist material facing said holes.

4,288,529
USE OF PHOTO-CURABLE COMPOSITE MATERIALS TO MAKE A STENCIL

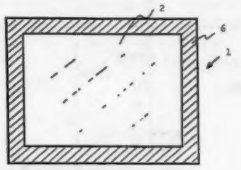
Takezo Sano, Takatsuki; Haruo Inoue, Kobe, and Akihiro Furuta, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company Limited, Higashi, Japan

Continuation of Ser. No. 888,864, Mar. 22, 1978, Pat. No. 4,216,287. This application Jan. 25, 1980, Ser. No. 115,492
Claims priority, application Japan, Mar. 26, 1977, 52/33782
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—308 **2 Claims**

1. A process for preparing a stencil which comprises:

placing a photomask on a photo-curable composite material which comprises a flat, flexible and photo-transmitting thin film (A); a flat and flexible film (B); a liquid photo-curable resin and a flat screen material, said films (A) and (B) being air-tightly bonded to each other at their peripheral portion thereof to form a flat inner space therebetween, said liquid photo-curable resin being disposed in said inner space to form a layer, and said screen material also being disposed in the inner space substantially in parallel with the inner walls of the films (A) and (B);

curing the liquid photo-curable resin in the photo-curable composite material by irradiation with actinic light through said photomask; and

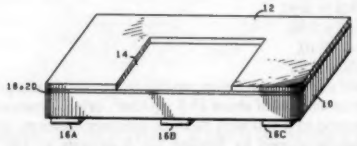


removing the uncured resin to develop an image after peeling off at least one film from the irradiated composite material.

4,288,530
METHOD OF TUNING APPARATUS BY LOW POWER LASER BEAM REMOVAL

Brian E. Bedard, Lochmere, N.H., and Gary R. Geller, Plantation, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 15, 1979, Ser. No. 84,941
Int. Cl.³ H01P *3/08*
U.S. Cl. 430—315 **7 Claims**



1. A method of tuning an apparatus for use in communications equipment comprising the steps of:

providing a non-conductive wafer;

providing on a first major surface of said wafer at least one conductive circuit element;

providing on the second major surface of said substrate a relatively large conductive area having generally a first predetermined thickness and having, opposite the at least one circuit element, a portion of a second predetermined thickness, the second predetermined thickness being substantially thinner than the first predetermined thickness; and

evaporating appropriate portions of the thinner portion of the large conductive area by means of a low-power laser beam having sufficient energy to evaporate the thinner portions of the conductive areas on the second major surface and insufficient energy to evaporate the thicker portions; thereby altering the capacitance between the conductive elements on the opposing sides of said wafer.

4,288,531
IMAGING ELEMENTS

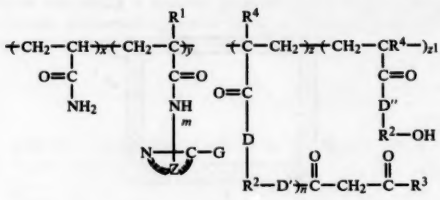
Anthony Adin; Richard C. Sutton, and Joseph A. Verdone, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 971,300, Dec. 20, 1978, abandoned. This application Sep. 26, 1979, Ser. No. 78,865
Int. Cl.³ G03C *1/40, 1/52, 1/10, 1/76*
U.S. Cl. 430—338 **16 Claims**

1. In an imaging element including a support and a radiation-responsive, image-forming composition capable of imagewise-converting an aromatic dialdehyde into a dye, said composi-

tion including said dialdehyde and comprising at least one layer on said support,

the improvement comprising a compatible polymer composition superimposed over said one layer, and having recurring units of the formula



wherein

R^2 is alkylene containing 1 to 3 carbon atoms;

R^3 is alkyl or alkoxy containing from 1 to 3 carbon atoms;

R^1 and R^4 are the same or different and each is hydrogen or methyl;

G is =O or hydrogen;

m and n are the same or different and each is 1 or 0;

D, D', and D'' are the same or different and each is —NH— or —O—;

Z is the atoms necessary to complete one or more saturated or unsaturated heterocyclic rings containing from 4 to 9 ring atoms; and

x, y, z and z^1 are weight percents, totalling 100, of the recurring units such that:

$50 \leqq x \leqq 90$,

$10 \leqq y \leqq 50$,

$0 \leqq z \leqq 10$,

$0 \leqq z^1 \leqq 10$,

said composition being capable when coated at a pH of 3.0 in an amount of about 21.5 mg/dm^2, dried, exposed for 0.5 second to a 400-watt medium-pressure mercury arc lamp and developed by heating for 5 seconds at 130° C., of producing with said one layer a maximum neutral density that is at least equal to that produced under identical conditions by the same element wherein said superimposed polymer composition consists essentially of poly(acrylamide-co-N-vinyl-2-pyrrolidone-co-2-acetoacetoxyethylmethacrylate) (50:45:5) at about 21.5 mg/dm^2.

4,288,532

COLOR PHOTOGRAPHIC MATERIALS CONTAINING CYAN COLOR-FORMING COUPLERS

Yoshio Seoka; Kozo Aoki; Yukio Yokota, and Seiiti Kubodera, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

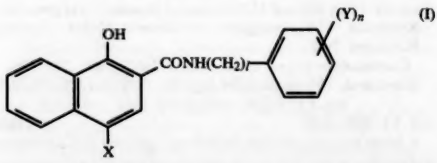
Filed Feb. 13, 1980, Ser. No. 120,962

Claims priority, application Japan, Feb. 13, 1979, 54/15885

Int. Cl.^{3} G03C *7/00, 1/40*

U.S. Cl. 430—385 **9 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer, said photographic light-sensitive material containing at least one cyan color-forming coupler represented by the following general formula (I):

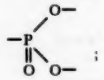


(I)

wherein l represents 0, 1 or 2; X represents a group of the formula (II):

$$-O-(B)_a-(L_1-D)_b-L_2 \quad \text{(II)}$$

capable of being released upon coupling reaction and having at least 6 carbon atoms and wherein in formula (II) L_1 represents an alkylene group having 1 to 12 carbon atoms which may be substituted or a phenylene group having 6 to 12 carbon atoms which may be substituted; L_2 represents a hydrogen atom, an alkyl group having 8 to 22 carbon atoms which may be substituted or a phenyl group which may be substituted; b represents 0, 1 or 2; D represents a divalent connecting group; B represents a divalent or trivalent group of —CO—, —CO_2—, —SO_2— or



a represents 0 or 1 and when a is 1 and B is a trivalent group another $-(L_1-D)_b-L_2$ group can be present,

Y represents RCONH—, RNHCO— or RNHCOHN— wherein R represents a hydrogen atom, a methyl group, an ethyl group or a methyl group substituted with one or more halogen atoms; n represents 1 or 2 and Y may be the same or different when n is 2; and the phenyl group can be substituted with a halogen atom, an alkyl group having 1 to 3 carbon atoms or an alkyl group having 1 to 3 carbon atoms.

9. A process of forming a cyan dye image which comprises developing an exposed color photographic light-sensitive material as claimed in claim **1** with an aqueous alkaline solution containing a primary aromatic amine developing agent.

4,288,533

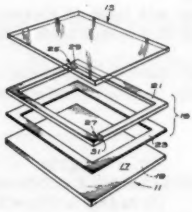
INSTANT FILM UNIT

Gerald M. Poshkus, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 5,406, Jan. 22, 1979. This application Apr. 24, 1980, Ser. No. 143,244

Int. Cl.^{3} G03C *1/48, 1/76*

U.S. Cl. 430—496 **7 Claims**



1. A photosensitive unit processable by a low viscosity processing fluid and comprising:

a first sheet including a layer of photosensitive material, a second sheet superposed with said first sheet for aiding in distributing the processing fluid over the photosensitive material, means for permanently securing said sheets together in closely spaced relationship around substantially the entire periphery of the sheets, a small access port extending from the exterior of the film unit into the space between the sheets which port comprises essentially a point source, uneffected by the orientation of the unit, for introducing the processing fluid into such space, and a small venting port extending from the space between the sheets to the exterior of the film unit for releasing air

displaced by the processing fluid when the fluid is introduced into such space.

4,288,534

PHOTOGRAPHIC SILVER HALIDE MATERIALS CONTAINING LIGHT-ABSORBING DYES

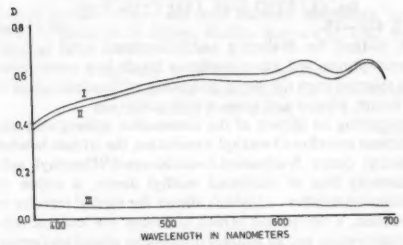
Raymond G. Lemahieu; Henri Depoorter, and Emiel A. Hofman, all of Mortsel, Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Feb. 15, 1980, Ser. No. 121,737

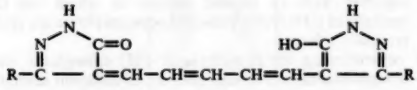
Claims priority, application United Kingdom, Mar. 2, 1979, 07439/79

Int. Cl.³ G03C *1/84*

U.S. Cl. 430—522 6 Claims



1. A photograhic light-sensitive material comprising a support and at least one light-sensitive silver halide emulsion layer wherein the emulsion layer or an antihalation layer coated on either side of the support comprises in dispersed state therein a 2-pyrazolin-5-one oxonol dye corresponding to the general formula:



wherein R represents a C_1-C_5 alkyl group.

4,288,535

PROCESS FOR PREPARING SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Hideo Kanisawa; Tamio Kitahata, and Hideo Horie, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 19, 1980, Ser. No. 151,410

Claims priority, application Japan, Jun. 16, 1979, 54/76215

Int. Cl.³ G03C *1/02, 1/28*

U.S. Cl. 430—569 8 Claims

1. A process for preparing a silver halide photographic emulsion which process comprises adding a water-soluble iridium compound in an amount of 10^{-7} to 10^{-4} mole per mole of the silver halide at the stage of precipitation of silver halide grains or physical ripening thereof, and adding a water-soluble iodide in an amount of 10^{-4} to 10^{-2} mole per mole of the silver halide and a sulfur sensitizer at the stage of chemical ripening thereof.

4,288,536

PHOTOTHERMOGRAPHIC STABILIZERS

Edward J. Goettert, and Gustav Gutman, both of Lake Elmo, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 5, 1979, Ser. No. 45,632

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—619 10 Claims

1. An unimaged photothermographic system having at least one emulsion layer comprising an image-silver source material of organic silver salts or complexed silver salts where the coordinating compound has a gross stability constant of between 4.50 and 10.0 with silver ion, silver halide in catalytic proximity to the image-silver source material, and a reducing agent for silver ion, where said system is characterized by having from 0.1/1 to 20/1 molar ratio to the silver halide in said emulsion of a heterocyclic compound selected from the group consisting of pyridines, 2-picolines, nicotinates, isonicotinates, 2,6-lutidenes, 4-picolines, quinolines, pyrazines, pyridazines, and pyrimidines.

4,288,537

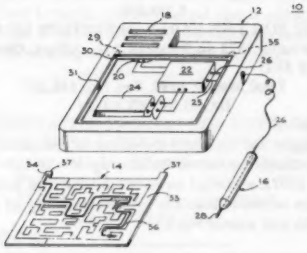
ELECTRONIC GAME

Robert C. Knetzger, Redondo Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 14, 1980, Ser. No. 111,573

Int. Cl.³ G09B *7/06;* A63H *5/00;* A63F *9/06*

U.S. Cl. 434—169 4 Claims



2. A toy for playing a plurality of games comprising a sound generating circuit, a game board, resistive material affixed to the top surface of the board, viewable by an operator of the toy, and connectable to the circuit and shaped to form both a resistor and a game path, first means for connecting the resistive material to the sound generating circuit including a conductor affixed to a portion of the resistive material, and second means for connecting the resistive material to the sound generating circuit including a movable conductor which is adapted to be guided by an operator of the toy along the game path while maintaining continuous contact with the resistive material, whereby the distance between the first and second means for connecting the resistive material to the sound generating circuit defines the resistor, the value of which determines the frequency of the sound generated by the sound generator circuit.

4,288,538

TEST METHOD AND COMPOSITION THEREFOR

Ernest V. Groman, Sommerville, and Marian E. Sacco, Rochester, both of N.Y., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 31, 1979, Ser. No. 8,124

Int. Cl.³ C12Q *1/134;* C01N *31/14*

U.S. Cl. 435—7 40 Claims

1. In a specific binding assay for the determination of the total amount of steriod present in a test sample containing steriod and steriod conjugates, wherein the improvement comprises, contacting the test sample substantially simultaneously with receptor for the steriod, and with an enzyme composition suitable for converting the steriod conjugates to the steriod under conditions suitable for the conversion of the steriod and the binding of steriod by the receptor.

4,288,539

BACTERIAL OR BACTERIAL ANTIBODY ASSAY

William J. McAleer, Ambler; Henry Z. Markus, Wyncote, and Roy A. Machlowitz, Glenside, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 794,772, May 9, 1977, abandoned. This application Feb. 28, 1979, Ser. No. 16,252
Int. Cl.[3] C12Q *1/04;* G01N *33/00*
U.S. Cl. 435—7 6 Claims

1. A method for determining the identity of a species of gram negative bacteria present in a sample comprising:

(a) incubating in the wells of a multiwell assay plate a serially diluted mixture of the sample together with reference antiserum to that bacteria, and a complement;

(b) adding a liquid growth medium to the wells containing the incubated mixtures resulting from step (a);

(c) incubating the wells containing the mixtures from step (b) for a time effective to permit bacterial growth to occur; and

(d) measuring and scoring the inhibition of bacterial growth in the liquid medium.

4,288,540

REAGENT FOR THE EARLY DETECTION OF CANCER

Hector Turcotte, 1572 du Ruisseau Ave., Sillery, Quebec, Canada (G1S 3V1)

Filed May 9, 1980, Ser. No. 148,257
Int. Cl.[3] G01N *33/54*
U.S. Cl. 435—7 7 Claims

1. A reagent for the early detection of cancer, comprising the water soluble extract of bacillus agrobacterium tumefaciens, strain 17022, adsorbed on red blood cells, on yeast cells or on particles selected from the group consisting of polyvinyl latex, kaolin and animal black.

4,288,541

ASCORBATE RESISTANT COMPOSITION, TEST DEVICE AND METHOD FOR DETECTING A COMPONENT IN A LIQUID TEST SAMPLE

Thomas A. Magers, South Bend, Ind.; John E. Sheats, Princeton, N.J., and David L. Tabb, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 15, 1979, Ser. No. 84,611
Int. Cl.[3] C12Q *1/28, 1/54*
U.S. Cl. 435—14 18 Claims

1. In a composition for determining the presence of a component in a test sample, wherein said composition comprises a reagent system containing a peroxidatively active substance, and an oxidation-reduction indicator capable of providing a detectable response in the presence of H_2O_2 and said peroxidatively active substance, and wherein said response is suceptible to being adversely influenced by the presence in said test sample of ascorbic acid, said composition further comprising a heavy metal compound which, in its ionized state, has an oxidation potential below that of said indicator, but above that of ascorbic acid,

the improvement wherein said heavy metal compound is a complex of mercuric ion and one or more ligands, said ligand being covalently bound to said ion to form a water-soluble complex, and said ligand having a higher oxidation potential than said ion in its complexed state; said complex having a K_s greater than about 10^7, wherein K_s is defined by the equation

$$K_s = \frac{[OH^-]^2}{4 \times 10^{-26}}$$

and said complex being substantially noninterfering with respect to said reagent system.

5. The improved composition of claim 1, 2, 3 or 4 wherein said test sample component is a sugar and wherein said reagent system comprises

an enzyme capable of promoting the oxidation of said sugar to produce peroxide,

and wherein said indicator is a chromogenic substance.

6. The improved composition of claim 5 wherein said sugar is glucose, said enzyme is glucose oxidase and said peroxidatively active substance is peroxidase.

4,288,542

RADIOENZYMATIC ASSAY OF CATECHOLAMINES

Garland A. Johnson, Charleston, and Jacob D. Peuler, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 681,999, Apr. 30, 1976, abandoned. This application Aug. 8, 1978, Ser. No. 931,651
Int. Cl.[3] C12Q *1/48, 1/00;* C12N *9/10*
U.S. Cl. 435—15 81 Claims

1. A method for analyzing undifferentiated, total endogenous epinephrine and norepinephrine levels in a mammalian system selected from the group consisting of the supernatant of blood serum, plasma and urine which comprises

a. contacting an aliquot of the mammalian system with the enzyme catechol-O-methyl transferase, the tritium labeled methyl donor S-adenosyl-L-methionine(^{3}H)methyl substantially free of unlabeled methyl donor, a cation of oxidation number +2 which allows the methyl transfer to proceed, a compound which stabilizes the enzyme-substrate system, and an amount of ethylene glycol bis-(amino ethyl ether)-N,N-tetracetic acid sufficient to remove transferase-inhibiting concentrations of calcium ions, to form a mixture,

b. incubating the mixture for a time, temperature and pH sufficient to O-methylate (^{3}H) substantially all of the epinephrine and norepinephrine;

c. extracting the O-methylated (^{3}H) epinephrine and norepinephrine with an organic solvent in which the O-methylated (^{3}H) epinephrine and norepinephrine are preferentially soluble;

d. repartitioning the O-methylated (^{3}H) epinephrine and norepinephrine into an aqueous acid of sufficient strength to protonate the amine;

e. oxidizing O-methylated (^{3}H) epinephrine and norepinephrine to vanillin-^{3}H,

f. extracting vanillin-^{3}H from the aqueous solution with an organic solvent in which the vanillin-^{3}H is preferentially soluble, and

g. counting the radiation emitted from the vanillin-^{3}H.

4,288,543

METHOD AND APPARATUS FOR IDENTIFYING MICROORGANISMS

Bruce H. Sielaff, Gales Ferry; Julius Praglin, East Lyme; James E. McKie, Jr., Ledyard; David K. Longhenry, East Lyme; Alan C. Curtiss, Old Lyme, and Charles B. Bidwell, Madison, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 763,719, Jan. 28, 1977, abandoned. This application Oct. 17, 1977, Ser. No. 842,736
Int. Cl.[3] C12Q *1/04, 1/12, 1/10;* C12M *1/34*
U.S. Cl. 435—34 4 Claims

1. A method of identifying a strain of microorganism in a liquid sample comprising the steps of dividing the sample into at least 18 sub-samples, inoculating each of the sub-samples with a growth-inhibiting agent whose reaction with the sub-samples has characteristics capable of identifying the strain of microorganism in said sample, the identity and/or quantity of the growth-inhibiting agent inoculated into each of said sub-samples being different, incubating the sub-samples to develop potentially significant differences in the growth of microorganism in each of them, reading a measure of the growth of the microorganism in each sub-sample, and comparing the growth readings with a bank of microorganism-identifying data rela-

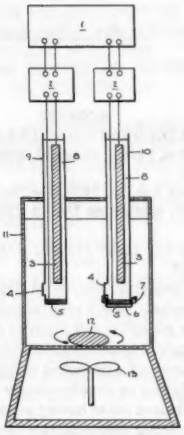
tive to said growth-inhibiting agents by quadratic discriminant function analysis, whereby the strain of microorganism in the sample is identified, said growth-inhibiting agents being selected from the group consisting of acriflavine, 9-amino-acridine, auramine O, brilliant green, cetrimide, cobalt chloride, cupric chloride, cycloserine, 3,5-dibromosalicylic acid, dodecylamine hydrochloride, 5-fluorouracil, floxuridine, malachite green, methylene blue, omadine disulfide, sodium omadine, sodium azide, thallous acetate, 2',3',4'-trihydroxyacetophenone, bacitracin, carbenicillin, cephalothin, colistin, kanamycin, methenamine mandelate, nalidixic acid, nitrofurantoin, novobiocin, polymyxin B and tetracycline.

4,288,544

METHOD AND APPARATUS FOR MEASURING MICROORGANISM ACTIVITY

Shuichi Suzuki, Tokyo, and Isao Karube, Tachikawa, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed May 1, 1979, Ser. No. 35,092
Claims priority, application Japan, Aug. 23, 1978, 53-101897
Int. Cl.[3] C12Q *1/06;* C12M *1/34*
U.S. Cl. 435—39 **4 Claims**



1. A method for determining the unknown number of living cells or total number of active parts in a liquid medium by measuring the difference between the current value or potential value of said microorganism and the current value or potential value of said liquid medium and correlating said measured difference with a current or potential difference which corresponds to a known amount of said microorganism.

4,288,545

MICROBIOLOGICAL PROCESS FOR REMOVING OLEAGINOUS MATERIAL FROM WASTEWATER AND MICROBIOLOGICAL COMBINATION CAPABLE OF SAME

Philip W. Spraker, Troutville, Va., assignor to Sybron Corporation, Rochester, N.Y.

Filed Jan. 17, 1979, Ser. No. 4,241
Int. Cl.[3] G12P *39/00*
U.S. Cl. 435—42 **16 Claims**

1. A process for removing oleaginous materials of animal origin or containing such of animal origin from wastewater comprising treating, under aerobic conditions, wastewater containing said oleaginous material with a microbial combination of:

(a) a microorganism of the strain *Pseudomonas aeruginosa* $SGRR_2$ (ATCC-31480); and

(b) at least one of:

(i) a microorganism of the genus Bacillus; and

(ii) a microorganism of the genus Pseudomonas other than said strain *Pseudomonas aeruginosa* $SGRR_2$.

4,288,546

PROCESS FOR THE LARGE SCALE PRODUCTION OF PITUITARY HORMONES BY SERIAL SECONDARY SUSPENSION CULTURE

Mandayam J. Narasimhan, Mysore, India, and John A. Anderson, Menlo Park, Calif., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 675,643, Apr. 9, 1976, Pat. No. 4,124,448. This application Nov. 6, 1978, Ser. No. 957,725
Int. Cl.[2] A01N *1/02;* C12P *21/02;* C12N *5/02*
U.S. Cl. 435—70 **4 Claims**

1. A nutrient culture medium composition adapted to the production of Prolactin from the pituitary by serial sub-culturing, said composition consisting essentially of amino acid-rich nutrient Medium 199-1X with Earle's modified salts supplemented by the addition of about 5 to 20 ml of liver extract and about 6 to 20 I.U. of insulin per liter of Medium 199-1X, minor amounts of anti-bacterial and anti-fungal agents and about 10 to 100 mg per liter of Medium 199-1X of an aqueous suspension of a substance with progesteron-androgenic activity.

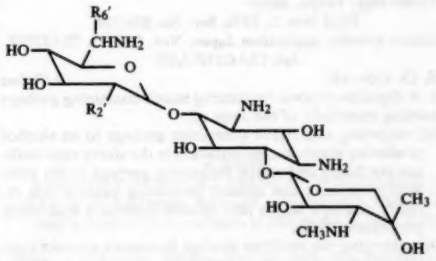
4,288,547

FERMENTATIVE PROCESS FOR PREPARING ANTIBIOTICS OF THE GENTAMICIN CLASS

Haruo Yamamoto, 11-16, Matsukazedai, Chigasaki City, Kanagawa Prefecture, Japan

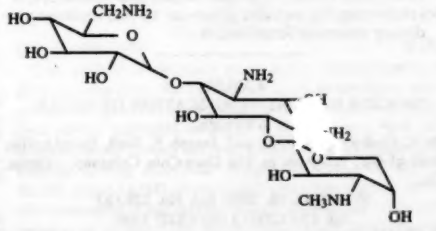
Filed Nov. 13, 1979, Ser. No. 93,062
Int. Cl.[3] C12P *19/48*
U.S. Cl. 435—80 **1 Claim**

1. A process for preparing a compound having one of the formulas:



Ia

or



Ib

where, in formula Ia, R_2' is hydroxy or amino and R_6' is hydrogen or methyl which comprises culturing a nutrient medium containing carbohydrates, a source of assimilable nitrogen, essential salts and D-streptamine with *M. purpurea* ATCC 31,536 and isolating the said compounds from the nutrient medium.

4,288,548

PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

Steven P. Barrett, Byron, Ill., and William J. Nelson, Camanche, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Filed Nov. 15, 1979, Ser. No. 94,520
Int. Cl.³ C12P *19/24*
U.S. Cl. 435—94 9 Claims

1. A process for enzymatically isomerizing glucose in an ion exchange refined glucose-containihg liquor to fructose comprising treating said refined liquor with an ion exchange material in the bisulfite/sulfite form ai.d contacting the treated liquor with immobilized glucose isomerase under glucose isomerizing conditions to convert a portion of the glucose to fructose.

4,288,549

METHOD OF PRODUCING THE A-30912 ANTIBIOTICS

LaVerne D. Boeck, and Ralph E. Kastner, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 46,744, Jun. 8, 1979, abandoned. This application Mar. 3, 1980, Ser. No. 126,078
Int. Cl.³ C12P *17/18*
U.S. Cl. 435—119 7 Claims

1. The method of producing the A-42355 antibiotic complex comprising A-30912 factors A, B, D, and H which comprises cultivating *Aspergillus nidulans* var. *roseus* NRRL 11440 in a culture medium containing assimilable sources of carbohydrate, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced.

4,288,550

TREATING PROCESS OF GARBAGE CONTAINED WASTES

Masahiko Ishida; Ryoichi Haga, and Yoji Odawara, all of Hitachi, Japan, assignors to The Agency of Industrial Science and Technology, Tokyo, Japan

Filed Nov. 1, 1978, Ser. No. 956,724
Claims priority, application Japan, Nov. 8, 1977, 52-133017
Int. Cl.³ C12P *5/02*
U.S. Cl. 435—167 9 Claims

1. A digestion process for treating starch containing garbage consisting essentially of the steps of:

(a) subjecting said starch containing garbage to an alcohol producing anaerobic fermentation in the slurry state without sterilizing said starch containing garbage in the presence of at least one ethanol producing yeast which directly converts starch into ethanol without a hydrolysis pretreatment step,

(b) subjecting the resultant alcohol fermented product containing ethanol directly to methane producing anaerobic fermentation in the presence of methane producing bacteria which directly converts ethanol into methane, and

(c) recovering the methane generated by said methane producing anaerobic fermentation.

4,288,551

PROCESS FOR THE PURIFICATION OF SUGAR SYRUPS

Geir V. Gudnason, Atlanta, and Joseph E. Stell, Douglasville, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Mar. 10, 1980, Ser. No. 128,683
Int. Cl.³ C13D *3/00*; C12P *3/00*
U.S. Cl. 435—168 62 Claims

1. A process for the purification of an impure sugar syrup comprising:

a. maintaining said syrup at a temperature not greater than about 72° C. and not less than that at which formation of a primary floc may proceed to substantial completion;

b. combining said syrup with not less than about 25 ppm of hydrogen peroxide by volume of syrup, and an amount of a primary-floc-forming chemical couple sufficient to form a primary floc in said hydrogen peroxide containing syrup, said primary floc being formed in an amount sufficient to capture a substantial portion of the impurities present in said syrup;

c. mixing into said syrup an amount of catalase sufficient to cause rapid decomposition of said hydrogen peroxide with resultant rapid generation of oxygen bubbles;

d. dispersing throughout said syrup an amount of a polyelectrolyte sufficient to form a secondary floc having entrapped therein sufficient quantities of said oxygen bubbles to cause flotation, said dispersing being done by agitation such that a sufficient amount of said bubbles will be retained by said secondary floc to cause flotation, said dispersing being begun not more than about 180 seconds following said mixing;

e. discontinuing said agitation not more than about 180 seconds following the commencement of said dispersing;

f. allowing the flotation of said secondary floc thereby leaving a substantially purified sugar syrup; and

g. separating said purified sugar syrup from said secondary floc.

4,288,552

IMMOBILIZED INTRACELLULAR ENZYMES

Stina M. Gestrelius, Farum, Denmark, assignor to Novo Industri A/S, Denmark

Filed Apr. 11, 1979, Ser. No. 29,156
Claims priority, application United Kingdom, Apr. 19, 1978, 15521/78
Int. Cl.³ C12N *11/00, 11/16, 11/02*
U.S. Cl. 435—174 15 Claims

1. Process for immobilization of an intracellular, glutaraldehyde sensitive enzyme, which process comprises reacting in an aqueous medium microbial cell material containing therein an intracellular glutaraldehyde sensitive enzyme with glutartaldehyde in the presence of a branched polyalkalene imine added to the medium before or simultaneously with the glutaraldehyde, said polyalkalene imine having primary amino groups on the polyalkalene imine molecule at a ratio of primary amine equivalents to aldehyde equivalents in the range of from 0.01:1 to 10:1, and thereafter recovering the resulting immobilized enzyme contairing microbial cell preparation.

4,288,553

DISOPYRAMIDE COMPOUNDS FOR CONJUGATING PROTEINS USED IN IMMUNOASSAYS FOR DISOPYRAMIDE

Prithipal Singh, Sunnyvale; Pyare L. Khanna, San Jose, and Floyd W. Colvin, Redwood City, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Feb. 11, 1980, Ser. No. 120,590
Int. Cl.³ C12N *9/96*; G01N *33/54*; C02D *211/00*
U.S. Cl. 435—188 12 Claims

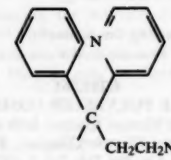
1. A compound of the formula:

$$(A—CONHR(CO)_m)_nZ$$

wherein:

A is of the formula:

A =



R is a saturated aliphatic linking group of from one to six carbon atoms;

Z is hydrogen, hydroxyl, alkoxyl, a group forming an activated ester capable of amide formation in an aqueous medium, or a polypeptide which is antigenic or an enzyme;

m is zero or one when Z is a poly(amino acid) and is otherwise one; and

n is one when Z is other than a poly(amino acid) and is otherwise one to the molecular weight of Z divided by 500.

4,288,554

PROCESS FOR THE CULTIVATION OF YEAST CELLS

Aldo Zotti, and Giuliano Cardini, both of Milan, Italy, assignors to Euteco Impianti S.p.A., Milan, Italy

Filed Dec. 20, 1979, Ser. No. 105,486
Int. Cl.³ C12N *1/32*
U.S. Cl. 435—247 **11 Claims**

1. In a continuous process for the cultivation of yeast cells in an aqueous growth medium and under aerobic conditions, in which an aqueous nutrient medium comprising a source of assimilable nitrogen and methanol as a source of assimilable carbon is continuously delivered to a fermenting vessel containing the growth medium, and in which a stream of growth medium is continuously discharged from said vessel with recovery of the yeast cells present therein, the improvement which comprises using a yeast of the species *Candida boidinii* and using a nutrient medium comprising a primary source of assimilable nitrogen consisting of urea and a secondary source of assimilable nitrogen consisting of one or more compounds chosen from the group consisting of ammonia, ammonium hydroxide and ammonium salts, the ratio between nitrogen in the primary source and that in the secondary source being from 2:1 to 1:20.

4,288,555

METHOD FOR THE CULTIVATION OF BASIDIOMYCETES

Chikao Yoshikumi, Kunitachi; Toshihiko Wada, Mibu; Himromitsu Makita, Tokyo, and Kinzaburo Suzuki, Mibu, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 823,110, Aug. 9, 1977, abandoned. This application Dec. 17, 1979, Ser. No. 104,400
Claims priority, application Japan, Aug. 24, 1976, 51-100157
Int. Cl.³ C12N *1/14*
U.S. Cl. 435—254 **1 Claim**

1. In a method for growing a fungus *Coriolus versicolor* (Fr.) Quél. by inoculating a culture medium with a homogenized slurry of seed mycelia of said fungus and cultivating said mycelia under submerged conditions to produce growth of said fungus, the improvement comprising the steps of:

treating seed mycelial lumps of said fungus with rotating propellers in a homogenizing apparatus at a speed of 3,000 to 6,000 r.p.m. for 1.5 to 2.5 minutes, thereby reducing the size of said seed mycelial lumps to 50 to 1,000 microns and at the same time obtaining homogeneously dispersed seed mycelia in the form of threads while substantially preventing cuts into said seed mycelia

inoculating said culture medium with the thus obtained seed mycelia at an inoculating rate of 0.01 to 0.2 g of said seed mycelia per liter of said culture medium, and

carrying out said cultivation under submerged conditions.

4,288,556

MICROORGANISM AND PROTEOLYTIC ENZYME DERIVED THEREFROM

Andre Belloc, Vanves; Jean Florent, Boulogne sur Seine; Jean Lunel, Paris; Jean-Claude Palla, Thiais, and Denise Mancy, Charenton le Pont, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Aug. 16, 1977, Ser. No. 825,055
Claims priority, application France, Aug. 24, 1976, 76 25631
Int. Cl.³ C14C *1/00*; C12N *9/52, 1/20*
U.S. Cl. 435—265 **14 Claims**

7. A proteolytic enzyme produced by culturing *Streptomyces caligosus* DS 14,486, said enzyme comprising a protein substance in the form of a powder having a brown to black color, a molecular weight of about 27,000, and an isoelectric point of about 3.7, said enzyme being rather soluble in water, slightly soluble in concentrated aqueous solutions of neutral salts and in water-alcohol or water-acetone mixtures and virtually insoluble in anhydrous alcohols and ketones and having a maximum activity on casein at a pH of 7.5 and a temperature of 45° C., a coagulant activity on milk and a fibrinolytic activity on a fibrin clot and having a specific activity on the hair-skin bond such that in use in a process for the enzymatic depilation of animal skin, said enzyme affords recovery of both intact hair and intact skin.

4,288,557

ANTIGENIC COMPLEX FROM *N. GONORRHOEAE*

Yashwant D. Karkhanis, Fanwood, and Dennis J. Carlo, South Amboy, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 949,581, Oct. 12, 1978, Pat. No. 4,220,638, which is a continuation-in-part of Ser. No. 862,265, Dec. 20, 1977, abandoned. This application Mar. 5, 1980, Ser. No. 127,297
Int. Cl.³ C07G *7/00*
U.S. Cl. 435—272 **5 Claims**

1. A method of obtaining an antigenic, immunogenic, complex obtained from the cell surface of *N. gonorrhoeae* which is protective against *N. gonorrhoeae* having a molecular weight of from about 9,200,000 to about 9,500,000, over 80% of the complex being formed of five sub-units in approximately equal amount having molecular weight of about 68,000, about 50,000, about 34,000, about 27,000 and about 10,500, the complex containing a dry weight basis from about 90 to about 95% protein, up to about 7% lipopolysaccharide, about 2% carbohydrate and less than 1% of RNA, DNA and phospholipids which comprises stirring a homogenized cell paste of *N. gonorrhoeae* for from about 10 to about 15 hours, removing cellular debris, RNA and DNA from the homogenized extract, and separating a fraction having a molecular weight in excess of about 9,000,000.

4,288,558

PROCESS FOR THE MANUFACTURE OF OXYGEN-CONTAINING CARBON COMPOUNDS FROM SYNTHESIS GAS

Hans-Joachim Schmidt, Königstein; Friedrich Wunder, Flörsheim am Main; Hans-Jürgen Arpe, Kelkheim, and Ernst I. Leupold, Neu-Anspach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 25,033, Mar. 29, 1979, abandoned. This application Apr. 1, 1980, Ser. No. 136,270

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1978, 2814365; Jun. 10, 1978, 2825495; Nov. 18, 1978, 2850110

Int. Cl.[3] **C07C** *27/06*

U.S. Cl. 518—716 **13 Claims**

1. A process for the manufacture of acetic acid, ethanol, acetaldehyde and any secondary products thereof which comprises catalytically reacting carbon monoxide and hydrogen using a catalyst, applied onto a carrier, containing salts or complex compounds of rhodium either with a valence of less than 3 or prepared by reduction of correspondingly supported compounds of trivalent rhodium at a temperature below 300° C., halide ions and a co-catalyst of magnesium in the form of a salt or complex compound.

4,288,559

FLAME RESISTANT FOAM

Hans-Walter Illger, Roesrath; Manfred Dahm, Leverkusen, both of Fed. Rep. of Germany, and Alberto C. González-Dörner, Polinya, Spain, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 1, 1979, Ser. No. 90,195

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849649

Int. Cl.[3] **C08J** *9/40*

U.S. Cl. 521—55 **10 Claims**

1. A flame resistant foam-impregnated with a dispersion comprising:

(a) a polyurethane latex;

(b) an aluminum hydroxide;

(c) an aluminosilicate and

(d) surface active substances.

4,288,560

PROCESS FOR FOAMING PLASTICS

Rudolf Kirchmayr, Aesch; Werner Fussenegger, Basel, and Hugo Illy, Reinach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

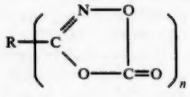
Continuation of Ser. No. 57,530, Jul. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,738

Claims priority, application Switzerland, Jul. 21, 1978, 7906/78

Int. Cl.[3] **C08J** *9/08*

U.S. Cl. 521—90 **9 Claims**

1. A process for foaming thermoplastic materials by adding to the plastics material a blowing agent consisting essentially of 0.05 to 5 percent by weight of a dioxazolone of the formula I



(I)

in which

n is 1, 2 or 3, and when n is 1

R is C_1–C_{12}-alkyl, C_7–C_9-aralkyl, C_3–C_6-cycloalkyl, C_6–C_{10}-aryl, or phenyl substituted by C_1–C_9-alkyl, halogen, C_1–C_9-alkoxy or nitro; or is a heterocyclic radical, or when n is 2

R is C_1–C_8-alkylene, m- or p-phenylene, m- or p-halophenylene, biphenylene, oxy-bis-(p-phenylene), 1,4-cyclohexylene, 2,5-thienylene, 2,5-furylene, 2,6-pyridylene or naphthylene, or when n is 3

R is phenenyl,

and subsequently heating the mixture.

4,288,561

FOAMABLE POLYESTER COMPOSITION

Donald I. Craft, and Morton Kramer, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 486,214, Jul. 5, 1974, abandoned. This application Feb. 22, 1978, Ser. No. 880,076

Int. Cl.[3] **C08J** *9/10*

U.S. Cl. 521—90 **18 Claims**

1. A foamable thermoplastic injection moldable composition consisting of in admixture: (a) a poly(1,4-butylene terephthalate) resin or copolyesters thereof; (b) a filler selected from the group consisting of fibrous glass or a mineral or mixtures thereof in an amount of from about 5 to about 50 weight percent; and, (c) a foaming agent in amounts of from about 0.02 to about 5.0 weight percent based on the weight of the resin selected from the group consisting of dinitrosopentamethylene tetramine, p-toluene sulfonyl semicarbazide, 5-phenyltetrazole, calcium oxalate and trihydrazino-s-triazine.

4,288,562

INITIATORS FOR ISOCYANATE REACTIONS

Jiri Kresta, Detroit, Mich., and Chen S. Shen, Strongsville, Ohio, assignors to The Dow Chemical Co., Midland, Mich.

Continuation of Ser. No. 890,153, Mar. 27, 1978, Pat. No. 4,220,728, which is a division of Ser. No. 695,897, Jun. 14, 1976, Pat. No. 4,111,914. This application Apr. 28, 1980, Ser. No. 144,737

Int. Cl.[3] **C08G** *18/06, 18/14, 18/16*

U.S. Cl. 521—121 **7 Claims**

1. A process for preparing a polyurethane foam from (A) an organic isocyanate containing an average of at least two isocyanate groups per molecule or mixture of such isocyanates with (B) a mixture of water and a polyol having at least two alkanol groups per molecule or a mixture of such polyols which comprises reacting (A) and (B) in the presence of (C) a volatile, low boiling solvent as an auxiliary blowing agent and (D) an ar-sulfonium areneoxide as a catalyst in an amount and under conditions sufficient to initiate the reaction between (A) and (B).

4,288,563

PROCESS FOR THE MANUFACTURE OF A GLASS FIBRE-REINFORCED PLASTICS ARTICLE AND A GLASS FIBRE PASTE OR SLURRY FOR USE IN THE PROCESS

David Thorpe, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 16, 1979, Ser. No. 21,427

Claims priority, application United Kingdom, Mar. 23, 1978, 11674/78; Feb. 15, 1979, 5423/79

Int. Cl.[3] **C08G** *18/14;* **C09K** *3/00;* **B32B** *5/02;* **C08K** *3/40*

U.S. Cl. 521—122 **8 Claims**

1. In a process for the manufacture of glass-reinforced plastics articles which comprises mixing liquid plastics forming ingredients together with chopped glass fibres and introducing the mixture so obtained into a mould, between mould surfaces or onto a former and allowing the mixture to set, the improvement which comprises using fibres which are:

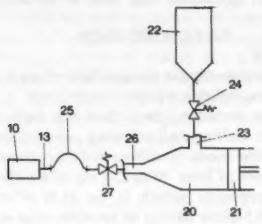
(a) bound with a size which is soluble in a liquid medium; and

(b) supported as a paste or slurry in said liquid medium which is either (i) compatible with said plastics forming ingredients or (ii) all or part of one or more of said plastics forming ingredients;

wherein when said fibres bound with said size are mixed with the liquid medium for support the fibres disperse readily into individual filaments.

5. A glass fibre paste or slurry suitable for use in the manufacture of glass-reinforced plastics articles by mixing liquid plastics forming ingredients together with chopped glass fibres and thereafter introducing the mixture so obtained into a mould, between mould surfaces or onto a former and allowing the mixture to react and set, which paste or slurry comprises:

(a) chopped glass fibre strands in filamentary form and



bound with a size which is soluble in a liquid plastics forming medium, and supported as a paste or slurry in

(b) liquid medium which is compatible with plastics forming ingredients or all or part of one or more of said plastics forming ingredients,

said fibres being characterized further by their substantial separation into individual filaments when mixed with said liquid medium.

4,288,564

PROCESS FOR THE PRODUCTION OF MICROCELLULAR ELASTOMERIC MOLDINGS AND THE RESULTANT PRODUCTS

Steven M. Conover, Pittsburgh; Robert M. Loring; William A. Ludwico, both of Library, all of Pa.; John W. Arnold, West Bloomfield, and George Ferber, Sterling Heights, both of Mich., assignors to Mobay Chemical Corporation, Pittsburgh, Pa. and General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 895,336, Apr. 11, 1978, abandoned. This application Jun. 28, 1979, Ser. No. 52,877

Int. Cl.³ B29D *27/00*

U.S. Cl. 521—122 **13 Claims**

1. A process for the production of Microcellular elastomeric moldings comprising:

(A) introducing a reaction mixture into a closed mold, said reaction mixture comprising:

(i) an organic polyisocyanate,

(ii) a hydroxyl group containing compound having a molecular weight of from 1800 to 12,000,

(iii) a catalyst for the reaction between hydroxyl groups and isocyanate groups,

(iv) an active aromatic diamine having at least one alkyl substituent in the orthoposition to a first amino group and two alkyl substituents in ortho-position to a second group, and

(v) air and/or nitrogen dissolved under pressure in any one or more of Components (i), (ii), (iii) or (iv),

(B) allowing said reaction mixture to react in said mold and

(C) removing the resultant product from said mold, the improvement wherein in any of Components (i), (ii), (iii) or (iv) which does contain said air and/or nitrogen dissolved therein there is included an inorganic, finely divided, nitrogen adsorbing agent in an amount sufficient to accelerate the transition of the air and/or nitrogen from the dissolved state to the dispersed state upon release of the pressure.

12. The product of the process of claim 1.

4,288,565

STORABLE, SOLID MIXTURE FOR THE PREPARATION OF PLASTICS WHICH ARE BASED ON EPOXIDE RESIN AND ARE STABLE TO HYDROLYSIS, THE USE OF THIS MIXTURE FOR THE PREPARATION OF SUCH PLASTICS AND PLASTICS OBTAINED IN THIS WAY

Friedrich Lohse, Oberwil; Ferdinand Gutekunst, Riehen; Rolf Schmid, Gelterkinden, all of Switzerland, and Andre Schmitter, Hegenheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,953

Claims priority, application Switzerland, Jun. 22, 1978, 6821/78

Int. Cl.³ C08L *63/00, 61/06*

U.S. Cl. 521—135 **13 Claims**

1. A storable, solid mixture for the preparation of a plastic which is based on epoxide resin and is stable to hydrolysis, which comprises (a) a long-chain, linear epoxide resin, which is free from ester groups, is solid at room temperature and has an epoxide equivalent weight of >700; (b) a compound which is free from ester groups, contains cyclic structures and 2 or 3 epoxide groups in the molecule and has an epoxide equivalent weight of 100 to 400, the components (a) and (b) being present in a ratio such that, per 1 total epoxide equivalent, 0.05 to 0.3 equivalent originates from (a) and 0.7 to 0.95 equivalent originates from (b); (c) the condensation product of 3 mols of phenol and 1 mol of acrolein, in an amount such that there are 0.5 to 1.1 equivalents of the phenolic hydroxy compound per epoxide equivalent with 0 to 70 equivalent % of said product being replaced by a phenolic bis-hydroxy compound; and (d) a curing accelerator.

4,288,566

PROCESS FOR THE PRODUCTION OF HIGHLY ELASTIC FOAMS CONTAINING URETHANE GROUPS FROM POLYETHERS, MODIFIED POLYISOCYANATES AND CROSS-LINKING AGENTS

Hanns P. Müller, Odenthal; Hansjürgen Rabe, and Kuno Wagner, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,250

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 2906879

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—158 **8 Claims**

1. A process for the production of highly elastic foams containing urethane groups and having increased impression hardness by reacting polyethers containing at least two hydroxyl groups having a molecular weight of 400 to 10,000 with modified polyisocyanates which contain carbodiimide groups, urethane groups, allophanate groups, isocyanurate groups, urea or biuret groups or combinations thereof in the presence of cross-linking agents and water and optionally in the presence of catalysts, emulsifiers, stabilizers, organic blowing agents and other auxiliaries and additives, characterized in that the reaction is carried out in the presence of 0.5 to 10 g/100 g of the polyether of a cross-linking mixture corresponding to the general formula

$$C_nH_{2n+2}O_n$$

wherein n=2 to 10,

which contains on a statistical average at least four hydroxyl groups per molecule.

4,288,567

ADHESIVE COMPOSITION AND METHOD OF PREPARATION

George W. Feeney, Akron, and William G. Stevenson, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 27, 1979, Ser. No. 70,379
Int. Cl.[3] C08L 53/02
U.S. Cl. 525—99 12 Claims

1. An adhesive composition which comprises an admixture of an unvulcanized block polymer product and a compatible tackifier resin therefor prepared by the method which comprises (A) mixing (1) 100 parts by weight of a solution polymerizate comprised of 100 parts by weight of an unvulcanized block styrene/isoprene polymer product with an overall styrene polymer content in the range of about 10 to 35 weight percent and its polymerization solvent in the range of about 300 to about 1100 parts by weight with (2) about 50 to about 200 parts by weight of a solution polymerizate comprised of 100 parts by weight of a tackifying resin for said block polymer product and its polymerization solvent in the range of about 25 to about 1100 parts by weight and (B) removing said solvent from the prepared mixture prior to its application as an adhesive; wherein the total of said polymerization solvents is a solvent for the combination of said block polymer and said resin; wherein said block polymer polymerizate is produced by the process of contacting isoprene and a suitable amount of divinylbenzene under solution polymerization conditions with a polystyryllithium catalyst, said amount of divinylbenzene being from about 0.5/1 to about 10/1 moles of divinylbenzene per mole of active lithium catalyst; and wherein said tackifier resin polymerizate is prepared by copolymerizing in the presence of a catalyst selected from the group consisting of aluminum chloride, boron trifluoride and boron trifluoride etherate, a mixture of piperylene and at least one olefin containing 4–6 carbon atoms in a diolefin/olefin more ratio in the range of about 0.6/1 to about 2.5/1, optionally modified by copolymerizing about 5 to about 20 weight percent, based on the total monomers, of at least one additional monomer selected from α-methyl styrene and di-cyclopentadiene in which the resin itself has a softening point in the range of about 50° C. to about 150° C.

4,288,568

ELASTOMERS CONTAINING CHEMICALLY BONDED METAL ATOMS

Kenneth W. Lewis, Westminster, and Robert C. Shaffer, Playa del Ray, both of Calif., assignors to Hitco, Irving, Calif.

Filed Jul. 30, 1980, Ser. No. 173,453
Int. Cl.[3] C08L 63/00
U.S. Cl. 525—111 13 Claims

1. An elastomer containing chemically bonded metal atoms obtained by reacting a diene elastomer with the reaction product of an epoxy resin and a metal containing polymer;

said metal containing polymer having been obtained by reacting a polycarboxylic acid and a metal complex which is a reaction product of tungsten carbonyl and/or molybdenum carbonyl with pyrrolidine.

4,288,569

POWER LACQUER BINDERS AND PROCESS FOR THE PREPARATION THEREOF

Ludwig Rottmaier, Odenthal; Rudolf Merten, Leverkusen; Rolf Dhein, and Hans J. Kreuder, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 29, 1980, Ser. No. 182,667
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935446
Int. Cl.[3] C08L 63/00
U.S. Cl. 525—113 7 Claims

1. A powder lacquer binder composition which comprises a homogenous, cross-linkable mixture comprising:

(A) A polymer containing more than one carboxyl group and having a melting and softening point of from 20° to 150° C. (as determined by differential thermoanalysis) and an acid number of from 10 to 150 mg of KOH/g; and

(B) a 1,2-polyepoxide which is an N,N',N''-triglycidyl triazolidine-3,5-dione having an epoxide value of from 0.6 to 1.13;

the mixture containing from 0.5 to 1.5 1,2-epoxide group per carboxyl group.

4,288,570

THERMOPLASTIC COMPOSITIONS OF EPICHLOROHYDRIN RUBBER AND POLY(ALKYL METHACRYLATE) RESIN

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed May 12, 1980, Ser. No. 149,074
Int. Cl.[3] C08L 63/00, 61/08
U.S. Cl. 525—133 5 Claims

1. An elastoplastic composition comprising a blend of about 75 to 50 parts by weight of cross-linked epichlorohydrin rubber in the form of dispersed particles of a size of 50 microns number average or less and about 25 to 50 parts by weight of poly(alkyl methacrylate) resin per 100 total parts by weight of epichlorohydrin rubber and poly(alkyl methacrylate) resin, which composition is elastomeric and processable as a thermoplastic.

4,288,571

POLYESTER COMPOSITIONS

Lowell R. Comstock, South Charleston, and Percy L. Smith, Dunbar, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 107,514, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 8,070, Feb. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 72,798, Sep. 16, 1970, Pat. No. 3,718,714. This application Feb. 26, 1973, Ser. No. 336,120
The portion of the term of this patent subsequent to Feb. 27, 1990, has been disclaimed.
Int. Cl.[3] C08L 67/06
U.S. Cl. 525—170 31 Claims

1. A composition, suitable for use in molding, comprising an ethylenically unsaturated monomer, an unsaturated polyester which is the condensation product of an ethylenically unsaturated polycarboxylic acid or anhydride and a polyol, and, as a low profile additive, in an amount of from about 1 to about 85 weight percent, based on weight of said unsaturated polyester, a carboxyl containing polymer of a vinyl ester of an aliphatic, saturated monocarboxylic acid, wherein said carboxyl containing polymer contains from about 0.2 to about 5 weight percent of a polymerized carboxyl containing comonomer, and at least about 5 weight percent of polymerized vinyl alkanoate.

4,288,572

BLENDS OF ETHYLENE-ALKYL ACRYLATE COPOLYMERS WITH CERTAIN POLYESTERS

Khalid A. Karim, and James H. Rea, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jul. 28, 1980, Ser. No. 172,595
Int. Cl.[3] C08L 67/02, 23/08
U.S. Cl. 525—176 11 Claims

1. A compatible blend of polymers consisting essentially of:

(a) 100 parts by weight of an ethylene copolymer, and

(b) About 0.2 to 3 parts by weight of a polyester resin;

said ethylene copolymer having polymerized therein about 70 to 98 weight % of ethylene and the balance an alkyl ester of acrylic or methacrylic acid; said polyester being poly(ethylene adipate) or poly(trimethylene adipate).

4,288,573

BLENDS OF LOW DENSITY ETHYLENE POLYMERS WITH CERTAIN POLYESTERS

Khalid A. Karim, and James H. Rea, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jul. 28, 1980, Ser. No. 172,594
Int. Cl.[3] C08L 23/06, 23/16, 67/02
U.S. Cl. 525—177 9 Claims

1. A compatible blend of polymers consisting essentially of:

(a) 100 parts by weight of an ethylene polymer, and

(b) About 0.2 to 3 parts by weight of a polyester resin; said ethylene polymer being a homopolymer of ethylene or copolymer of ethylene with higher alpha-olefins, having a density of less than about 0.945 and a melt index in the range of about 0.5–20, said polyester being poly(ethylene adipate) or poly(trimethylene adipate).

4,288,574

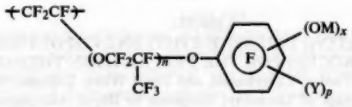
FLUORINATED PHENOXYPROPYL VINYL ETHER POLYMER

Burton C. Anderson, Wilmington, Del., and Ronald E. Uschold, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 30, 1979, Ser. No. 89,374
Int. Cl.[3] C08F 12/16, 16/00, 18/00; C25B 13/00
U.S. Cl. 525—331 12 Claims

1. Fluorinated phenolic polymer consisting essentially of recurring units of

(1) —CF_2CFX—wherein X in each of the recurring units is independently selected from F, Cl, R and OR wherein R is perfluoroalkyl of 1 to 4 carbon atoms and



wherein Y is Cl, R or OR wherein R is perfluoroalkyl of 1 to 4 carbon atoms; M is H, alkali metal or NR'$_4$ wherein R' in each of the recurring units is independently selected from H and alkyl of 1 to 6 carbon atoms; x is an average value within the range about 0.2 to about 1.0; n is 1, 2 or 3; and p is 0 or 1,

said polymer having 0 to about 21 units of (1) per unit of (2).

4,288,575

CONJUGATED DIENE BUTYL ELASTOMER COPOLYMER

Irwin J. Gardner, Fanwood, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 966,396, Dec. 4, 1978, Pat. No. 4,211,855, which is a division of Ser. No. 775,389, Mar. 7, 1977, Pat. No. 4,145,492. This application Sep. 17, 1979, Ser. No. 76,471
Int. Cl.[3] C08F 8/22, 8/26
U.S. Cl. 525—333 4 Claims

1. A conjugated diene butyl elastomer copolymer, said copolymer consisting of 85 to 99.5% by weight of a C_4–C_7 isoolefin combined with 15 to 0.5% by weight of a conjugated C_4–C_{14} diolefin, the copolymer having randomly distributed sites of conjugated diene unsaturation and a residual halogen content of 0.05 to 0.9% by weight, the halogen being present as primary allylic halogen, at least 50 mole % of said conjugated diene unsaturation being Diels-Alder active conjugated diene units.

4,288,576

2,5-DIMERCAPTO-1,3,4-THIADIAZOLE AS A CROSS-LINKER FOR SATURATED, HALOGEN-CONTAINING POLYMERS

John R. Richwine, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 942,856, Sep. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 842,839, Oct. 17, 1977, abandoned. This application Jun. 29, 1979, Ser. No. 53,449
The portion of the term of this patent subsequent to Dec. 5, 1995, has been disclaimed.
Int. Cl.[3] C08F 8/34, 8/30
U.S. Cl. 525—349 26 Claims

1. The process of cross-linking a halogen-containing polymer which contains at least about 2% by weight of halogen and less than 0.1 mole % ethylenic unsaturation, which comprises heating said polymer in the presence of 2,5-dimercapto-1,3,4-thiadiazole and a basic material selected from (1) amines having a boiling point above about 110° C. and a pK value below about 4.5; (2) salts of amines having pK values below about 4.5 with acids having pK values above about 2.0; (3) quaternary ammonium hydroxides and their salts with acids having pK values above about 2.0; (4) diphenyl- and ditolylguanidines; and (5) the condensation products of aniline and at least one mono-aldehyde containing one to seven carbon atoms in combination with at least an equal amount of an inorganic base.

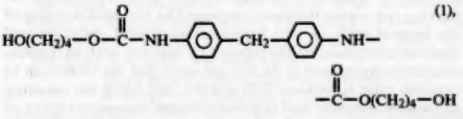
4,288,577

NOVEL URETHANEDIOLS AND POLYURETHANES THEREFROM

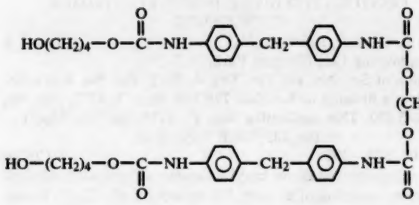
Herbert F. McShane, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 14, 1979, Ser. No. 103,577
Int. Cl.[3] C08G 18/32, 18/76; C07C 125/07, 125/077
U.S. Cl. 525—453 8 Claims

1. A composition of matter selected from the group consisting of the urethanediol having the following formula (1)

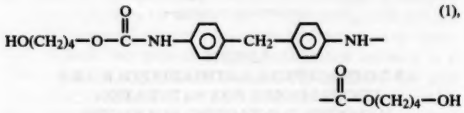


the urethanediol having the following formula (2)

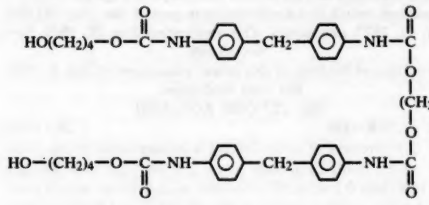


and a mixture of urethanediols having the above formulas (1) and (2).

5. In a process for curing an isocyanate-terminated polyurethane prepolymer with a diol, the improvement of using as the diol a mixture of about 85–92 weight percent of the diol of formula (1)



about 8–12 weight percent of the diol of formula (2)



and about 0–3 weight percent of 1,4-butanediol.

4,288,578

HIGH EFFICIENCY CATALYST FOR HIGH BULK DENSITY POLYETHYLENE

John T. T. Hsieh, Lake Charles, La., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 950,780, Oct. 12, 1978, Pat. No. 4,167,493, which is a continuation-in-part of Ser. No. 780,134, Mar. 22, 1977, abandoned. This application Apr. 30, 1979, Ser. No. 34,114

Int. Cl.³ C08F *4/02, 10/02*

U.S. Cl. 526—119 **3 Claims**

1. A process for the polymerization of alphamonoolefins having 2 to 6 carbon atoms comprising contacting said monoolefin at a temperature of from 40° to 200° C. at pressures of from 1 to 50 atmospheres in an inert hydrocarbon solvent or in the gas phase with a mixture of an alkylaluminum compound as activator-scavenger and a supported catalyst made by treating an anhydrous magnesium oxide support in hexane with methanol, removing the excess methanol from the support by drying the support under a vacuum to form a support containing between 0.004 and 10 moles of methanol per mole of magnesium oxide, refluxing the treated support with an equimolar mixture of titanium tetrachloride and tetrabutyltitanate, removing any excess titanium compound by repeated washing of the support with an inert hydrocarbon solvent, reducing said titanium compound on the support by reacting with an organoaluminum compound in an amount such that the aluminum to titanium ratio is between 0.05 and 0.5, and aging the resulting supported complex; said organoaluminum compound being of formula R_nAlX_{3-n}, wherein R is a hydrocarbon radical selected from branched or linear alkyl, alkenyl, cycloalkyl, aryl, alkylaryl, or arylalkyl radicals having 1 to 20 carbon atoms, X is hydrogen or halogen, and n is 1, 2 or 3.

4,288,579

PROCESS FOR PREPARING POLYOLEFINS

Mitsuji Miyoshi, Kanagawa; Yoshio Tajima, Tokyo; Kazuo Matsuura, Kawasaki; Nobuyuki Kuroda, Yokohama, and Mitsuo Matsuno, Kawasaki, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 27,929, Apr. 6, 1979, abandoned. This application Dec. 12, 1979, Ser. No. 102,646

Claims priority, application Japan, Apr. 11, 1978, 53/41715

Int. Cl.³ C08F *4/02, 10/06*

U.S. Cl. 526—124 **11 Claims**

1. A process for polymerizing or copolymerizing olefins containing from 3 to 8 carbon atoms using a catalyst consisting essentially of:

(A) a solid component obtained by contacting

(1) a reaction product resulting from heat reaction of magnesium oxide and an aluminum trihalide at 150° C. to 600° C. with

(2) a titanium halide and/or an addition product of a titanium halide and an aromatic carboxylic acid ester, and

(B) an organometallic compound and/or an addition product of an organometallic compound and an aromatic carboxylic acid ester; the total amount of aromatic carboxylic acid ester present in the polymerization system being at least 0.05 mol based on the amount of magnesium (gram-atom) contained in the catalyst system.

4,288,580

CATALYST AND PROCESS FOR THE POLYMERIZATION OF ALPHA-OLEFINS

John B. Rogan, Glen Ellyn, and Charles K. Buehler, Bolingbrook, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 641,437, Dec. 17, 1975, abandoned. This application Oct. 3, 1977, Ser. No. 838,552

Int. Cl.³ C08F *4/66, 10/06*

U.S. Cl. 526—138 **6 Claims**

1. An alpha-olefin polymerization catalyst composition which comprises:

(a) an alkylaluminum compound selected from the group consisting of a trialkylaluminum, a mixture of trialkylaluminum and an alkylaluminum dichloride of dibromide, a mixture of a trialkylaluminum and a dialkylaluminum chloride or bromide, and a dialkylaluminum chloride or bromide;

(b) an effective amount, ranging from about one to about twenty mol percent, of sulfur dioxide based upon the amount of titanium compound present;

(c) a titanium trichloride; and

(d) an effective amount of isobutylvinyl ether;

said effective amounts being effective to reduce levels of alkane solubles produced during polymerization of alpha-olefins without substantial decreases in polymer yield.

4,288,581

ALTERNATING ISOPRENE-ETHYLENE COPOLYMERS AND A PROCESS FOR THE PREPARATION THEREOF

Wolfgang Wieder, Leverkusen, and Josef Witte, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 20, 1980, Ser. No. 199,071

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1979, 2943129

Int. Cl.³ C08F *4/76, 236/08*

U.S. Cl. 526—169.2 **10 Claims**

1. Isoprene-ethylene copolymers having alternating monomer units in which the proportion of recurring

—isoprene-ethylene—

sequences is more than 80 mol %, in which the proportion of built-in isoprene in the 1,4-configuration is more than 80 mol % which consists of more than 70 mol % of a trans-arrangement, and in which less than 5 mol % of the built-in isoprene is present in the 3,4-configuration, the copolymers having a glass temperature of between −70° C. and −90° C., a Mooney-viscosity of between 30 and 150 [ML 1+4 (100° C.)] and a viscosity number [η], measured at 25° C. in toluene, of between 0.5 and 6.

4. A process for the preparation of isoprene ethylene copolymers according to any of claims **1** to **3**, characterized in that polymerization is carried out in solution at a temperature of between −80° C. and +100° C. in the presence of a catalyst system which consists of

(a) a vanadium compound of the formula $VO(OR)_2X$ and

(b) an organoaluminum compound of formula AlR'_3, $HAlR'_2$ or R'_2A1Y

wherein

R represents an alkyl group containing from 1–20 carbon atoms,

X represents a halogen atom,

R′ represents an alkyl group containing from 1 to 8 carbon atoms,

Y represents a halogen atom.

whereby the molar ratio of b:a is between 100:1 and 1:10.

4,288,582

AQUEOUS DRILLING FLUID ADDITIVE, COMPOSITION AND PROCESS

James M. Lucas; Alphonse C. Perricone, and Dorothy P. Enright, all of Houston, Tex., assignors to Milchem Incorporated, Houston, Tex.

Division of Ser. No. 946,227, Sep. 27, 1978. This application Oct. 29, 1979, Ser. No. 88,894

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.[3] **C08F** *22/38*

U.S. Cl. 526—240 **9 Claims**

1. A solid, dry, particulate terpolymer consisting essentially of from about 5 to about 62 mole percent of alkali metal acrylate units; from about 2 to about 40 mole percent of hydroxyalkyl acrylate units selected from 2-hydroxyethyl acrylate, 2-hydroxypropyl acrylate and 2-hydroxybutyl acrylate units; and from about 31 to about 91 mole percent of acrylamide units; said terpolymer being suitable for use as a filtration control agent for aqueous based drilling fluids which will not adversely affect the rheological properties of an aqueous drilling fluid in which it is incorporated, which is comparatively insensitive to salt environments and concentrations, and which retains its effect as a filtration control agent even after exposure to increased temperatures as high as about 300° F.

4,288,583

CURABLE MIXTURES BASED ON MALEIMIDES AND 1-PROPENYL-SUBSTITUTED PHENOLS

Abdul-Cader Zahir, Oberwil, and Siegfried Wyler, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,593

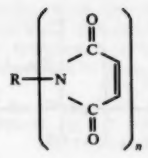
Claims priority, application Switzerland, Dec. 29, 1978, 13279/78

Int. Cl.[3] **C08F** *16/02, 122/40, 226/06*

U.S. Cl. 526—262 **7 Claims**

1. A curable mixture which consists essentially of

(a) at least one maleimide of formula I



(I)

wherein R is an n-valent aliphatic or aromatic radical, and n is the number 1, 2 or 3; and

(b) at least one mono- or polyvalent phenol which contains in the molecule at least one 1-propenyl group in the ortho- or para-position with respect to the hydroxyl group, or an isomeric mixture of mono- or polyvalent phenols which are propenyl-substituted in the ortho- or para-position and of mono- or polyvalent phenols which are allyl-substituted in the ortho- or para-position, the proportion of propenyl groups in the isomeric mixture having to be at least 5 equivalent-%, relative to the sum of the equivalents of propenyl and allyl groups;

said mixture containing for each equivalent of imide group in the maleimide of component (a) from 0.05 to 10 mols of the propenyl-substituted phenol or isomeric mixture of phenols of component (b).

4,288,584

ELECTRET MADE OF BRANCHED ALPHA-OLEFIN POLYMER

Anupama Mishra, Guelph, Canada, assignor to Uniroyal Ltd., Ontario, Canada

Filed Oct. 30, 1978, Ser. No. 955,822

Claims priority, application Canada, Aug. 10, 1978, 309053

Int. Cl.[3] **C08F** *110/14;* **H01G** *7/02*

U.S. Cl. 526—348.4 **5 Claims**

1. A homoelectret comprising an electrostatically polarized resinous polymer of an alpha-olefin having a branched side chain, said polymer being composed of repeating units having the structure

wherein R is a branched alkyl radical having from 3 to 10 carbon atoms, the said polymer having a crystallinity of at least 20% by weight.

4,288,585

CARBORANYLCYCLOTRIPHOSPHAZENES AND THEIR POLYMERS

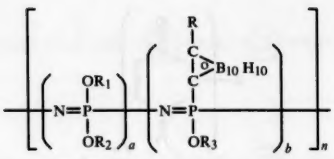
Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Harry R. Allcock, State College, Pa.; John P. O'Brien, Wilmington, Del.; Angelo G. Scopelianos, University Park, Pa., and Larry L. Fewell, San Jose, Calif.

Filed Mar. 12, 1980, Ser. No. 129,799

Int. Cl.[3] **C08G** *73/00, 79/02*

U.S. Cl. 528—4 **4 Claims**

1. A carboranylphosphazene polymer having the formula



wherein the ratio of a to b is about 2:1; n is an integer such that the molecular weight of the polymer is within the range of about 1×10^5 to 1×10^6; R is selected from the class consisting of hydrogen, alkyl radicals of up to about 6 carbon atoms, and aryl radicals of up to about 9 carbon atoms; R_1, R_2, and R_3 are selected from the class consisting of alkyl radicals containing up to about 6 carbon atoms, fluorinated alkyl radicals containing up to about 6 carbon atoms, aryl radicals containing up to about 9 carbon atoms, chlorinated aryl radicals containing up to about 9 carbon atoms, and mixtures thereof.

4,288,586

PROCESS FOR THE PREPARATION OF POLYISOCYANATES CONTAINING ISOCYANURATE GROUPS

Manfred Bock, Leverkusen; Josef Pedain, and Wilhelm Slawyk, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 12, 1979, Ser. No. 11,465

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806731

Int. Cl.³ C08G *18/79, 18/80, 18/16*

U.S. Cl. 528—67 **12 Claims**

1. A process for the preparation of polyisocyanates containing isocyanurate groups which are soluble in lacquer solvents comprising

(a) partially trimerizing the isocyanate groups of 1-isocyanato-3,3,5-trimethyl-5-isocyanatomethyl-cyclohexane in the presence of catalyst(s) which are inactivated by heat and which accelerate the trimerization of isocyanate groups and

(b) thermally deactivating the catalyst(s), characterized in that the catalyst(s) used are quaternary hydroxyl alkyl ammonium hydroxides containing at least one hydroxy alkyl group.

9. In a process for the production of polyurethane lacquers from polyisocyanates, the improvement which comprises using polyisocyanates containing isocyanurates prepared by the process of claim **1**.

4,288,587

PREPARATION OF NONCELLULAR POLYURETHANE COMPOSITIONS

Richard J. Turley, Orange, and David R. MacFarland, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 5, 1980, Ser. No. 146,856

Int. Cl.³ C08G *18/22*

U.S. Cl. 528—57 **13 Claims**

1. A process for preparing a noncellular polyurethane which comprises reacting an organic polyisocyanate with a chlorine-containing polyol in the presence of a catalytic amount of a metal carboxylate compound selected from the group consisting of an alkali metal salt of a carboxylic acid, an alkaline earth metal salt of a carboxylic acid and mixtures thereof, said chlorine-containing polyol having an average of 2–8 hydroxy groups and being comprised of the product of the acid-catalyzed condensation of a polyhydroxy initiator with 4,4,4-trichloro-1,2-epoxybutane or a mixture thereof with a halogen-free epoxide.

4,288,588

METHYL-SUBSTITUTED POLYPHENYLCARBOXYLIC ACIDS

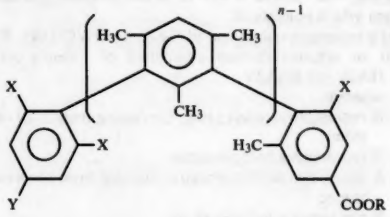
John A. Donohue, Elmhurst, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 622,656, Oct. 15, 1975, Pat. No. 4,154,922, which is a continuation-in-part of Ser. No. 517,506, Oct. 24, 1974, abandoned. This application Jul. 13, 1978, Ser. No. 924,145

Int. Cl.³ C08G *69/32, 69/26*

U.S. Cl. 528—348 **20 Claims**

1. A methyl-substituted polyphenyl compound of the structural formula



wherein n is a whole number from 2 to 3 inclusive, Y is selected from the class consisting of methyl acylhalide and —COOR, R is hydrogen or a monovalent alkyl group of 1 to 24 carbon atoms, when Y is methyl, each X is methyl and when Y is —COOR, each X is selected from the class consisting of methyl and —COOR.

4,288,589

CATIONIC DYES

Peter Loew, Münchenstein, and Rudolf Zink, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

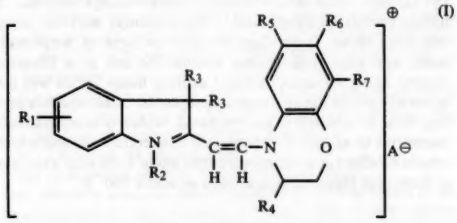
Filed Jun. 20, 1979, Ser. No. 50,247

Claims priority, application Switzerland, Jun. 30, 1978, 7165/78

Int. Cl.³ C07D *413/06*

U.S. Cl. 542—466 **23 Claims**

1. A cationic dye of the formula I



wherein

R_1 is hydrogen, halogen, lower alkyl, lower alkoxy or NO_2,

R_2 is unsubstituted lower alkyl, or lower alkyl which is substituted by: hydroxyl, lower alkoxy, halogen, CN, carboxylic acid amide, carboxylic acid alkyl ester or phenyl, or R_2 is alkenyl (C_3–C_4), the

R_3's independently of one another are each lower alkyl, or both R_3's together form a carbocyclic 5-, 6- or 7-membered ring,

R_4 is hydrogen, lower alkyl, unsubstituted aryl or substituted aryl,

R_5, R_6 and R_7 independently of one another are hydrogen, lower alkyl, lower alkoxy, halogen, NO_2, CN or lower alkylsulfonyl, and

A is an anion.

4,288,590

7-[Dα-(4-HYDROXY-1,5-NAPHTHYRIDINE-3-CARBOXAMIDO)-α-ARYLACETAMIDO]-3-(N,N-DIMETHYLAMINOMETHYLPYRIDINIUM) METHYL-3-CEPHEM-4-CARBOXYLATES

Masahisa Oka; Jun Okumura, both of Yokohama, and Takayuki Naito, Kawasaki, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

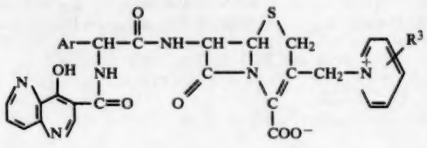
Filed Feb. 14, 1980, Ser. No. 121,623

The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.

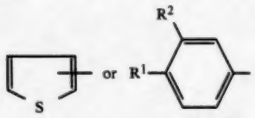
Int. Cl.[3] **C07D** *501/40*

U.S. Cl. 544—25 **26 Claims**

1. A compound having the D-configuration in the 7-side-chain and the formula



wherein Ar is



wherein R^1 is hydrogen or hydroxy and R^2 is hydrogen, hydroxy, methyl, methoxy or chloro and R^3 is N,N-dimethylaminomethyl.

4,288,591

4-SUBSTITUTED 2-IMINOIMIDAZOLIDINE COMPOUNDS

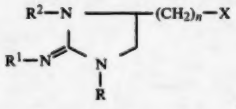
Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Division of Ser. No. 9,899, Feb. 6, 1979, Pat. No. 4,247,705. This application May 5, 1980, Ser. No. 146,860

Int. Cl.[3] **C07D** *413/06, 401/06, 403/06, 233/46*

U.S. Cl. 544—139 **11 Claims**

1. A 2-iminoimidazolidine compound corresponding to the formula:



wherein R is loweralkyl; R^1 is a member selected from hydrogen, loweralkyl, phenyl, loweralkylphenyl, and chlorophenyl; R^2 is a member selected from loweralkyl, phenyl, loweralkylphenyl and chlorophenyl; X is a member selected from amino, diloweralkylamino, di(phenylloweralkyl)amino, 1-piperidino, 1-piperazino, and 1-morpholino; and n is the integer 1 or 2, or a pharmaceutically acceptable acid addition salt thereof.

4,288,592

PROCESS FOR PREPARING AMIDES BY REACTION IN PRESENCE OF MOLECULAR SIEVE

Michael M. Rauhut, Bridgewater, and Shin-Shyong Tseng, Raritan, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 30, 1979, Ser. No. 34,120

Int. Cl.[3] **C07C** *103/34, 103/737, 103/76, 143/74, 143/77, 143/78, 143/83*

U.S. Cl. 544—159 **9 Claims**

1. A process for preparing amides which comprises reacting an amine, or amide, and an acid halide, or anhydride, in suitable molecular proportions, in an inert organic solvent, in the presence of an effective amount of a molecular sieve, until the reaction is completed, separating the molecular sieve and without another acid-binding agent, and recovering the amide from the organic mother liquor.

4,288,593

POLYALKYLPIPERIDINE DERIVATIVES OF s-TRIAZINES

Jean Rody, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 28, 1980, Ser. No. 115,640

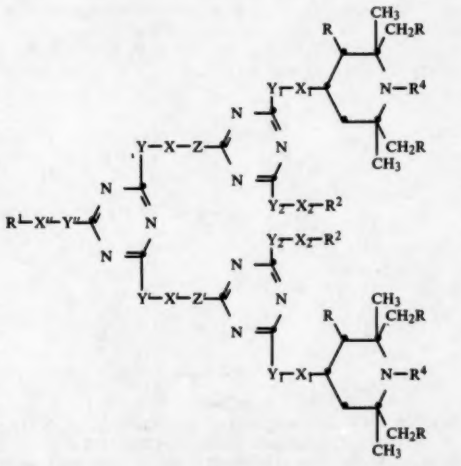
Claims priority, application Switzerland, Feb. 6, 1979, 1146/79

Int. Cl.[3] **C07D** *401/14*

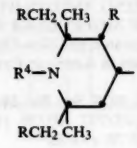
U.S. Cl. 544—198 **8 Claims**

1. A compound of the formula I

I

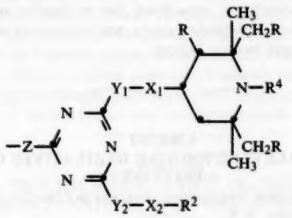


in which X and X′ are C_2–C_{12}-alkylene, which can be interrupted by —O—, —S— or —NR^3—, or p-xylylene, X″ has one of the meanings defined for X and X′ or is a direct bond or a group —$OCH_2CH_2CH_2$—, the O of which is not bonded to Y″, X_1 and X_2 are a direct bond, C_1–C_4-alkylene or a group —$OCH_2CH_2CH_2$—, the O of which is not bonded to Y_1 or Y_2, and Y_1, Y_2, Z and Z′ are —O—, —S—, —NH— or —NR^3—, Y, Y′ and Y″ are —O—, —S—, —NH—, —NR^3— or —NR^5—, R is hydrogen or methyl, R^1 is hydrogen, C_1–C_{18}-alkyl, C_2–C_8-alkoxyalkyl, C_2–C_4-hydroxyalkyl, C_5–C_{12}-cycloalkyl, allyl, benzyl, C_6–C_{10}-aryl or phenyl which is substituted by 1 or 2 C_1–C_8 alkyl groups or OH or C_1–C_4-alkoxy or is a polyalkylpiperidinyl group of the formula II



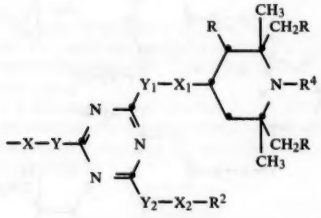
(II)

or, if Y″ is —NR³— and X″ is a direct bond, R¹ and R³ together with the N atom form a pyrrolidine, piperidine or morpholine ring, or R¹ is a radical of the formula III



III

or the group R¹—X″—Y″— is chlorine, R² is C₁–C₁₈ alkyl, C₂–C₈ alkoxyalkyl, C₂–C₄ hydroxyalkyl, C₅–C₁₂ cycloalkyl, allyl, benzyl, C₆–C₁₀ aryl or phenyl which is substituted by 1 or 2 C₁–C₈ alkyl groups or OH or C₁–C₄ alkoxy or is a polyalkylpiperidinyl group of the formula II or, if Y₂ is —NR³— and X₂ is a direct bond, R² and R³ together with the N atom form a pyrrolidine, piperidine or morpholine ring, R³ is C₁–C₁₈ alkyl, C₂–C₈ alkoxyalkyl, C₂–C₄ hydroxyalkyl, C₅–C₁₂ cycloalkyl, allyl, benzyl, C₆–C₁₀ aryl or phenyl which is substituted by 1 or 2 C₁–C₈ alkyl groups or OH or C₁–C₄ alkoxy or is a polyalkylpiperidinyl group of the formula II, R⁴ is hydrogen, O•, C₁–C₁₈-alkyl, allyl or benzyl and R⁵ is a radical of the formula IV



IV

4,288,594

CAUSTIC-FREE PROCESS FOR THE PRODUCTION OF MONOCHLORO-DIAMINO-S-TRIAZINES

Philip G. McCracken; Hal Myatt, both of Greensboro, and Harris E. Petree, Kernersville, all of N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 48,868, Jun. 15, 1979, abandoned, which is a continuation-in-part of Ser. No. 933,375, Aug. 14, 1978, abandoned, which is a continuation of Ser. No. 753,032, Dec. 22, 1976, abandoned. This application Feb. 4, 1980, Ser. No. 118,375

Int. Cl.³ C07D *251/50*

U.S. Cl. 544—204 **12 Claims**

1. A three-stage process for the preparation of a monochloro-diamino-s-triazine which comprises:

(a) reacting at elevated temperature and normal or elevated pressure, and in an organic solvent, cyanuric chloride and a monoalkylamine hydrochloride in substantially stoichiometric amounts to form 2,4-dichloro-6-alkylamino-s-triazine and two moles of HCl gas,

(b) reacting the solution of step a) at a less elevated temperature and normal pressure with 100% or greater excess of a different monoalkylamine to form a monochloro-diamino-s-triazine and monoalkylamine hydrochloride, and

(c) distillatively exchanging the monoalkylamine hydrochloride obtained in step b) with the monoalkylamine in step (a) to generate the monoalkylamine hydrochloride needed in step (a) and the free monoalkylamine needed in step (b).

4,288,595

7-(SUBSTITUTED)-7H-PYRROLO[3,2-f]QUINAZOLINE-1,3-DIAMINES

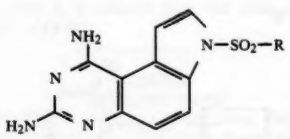
Kurt W. Ledig, deceased, late of Philadelphia, Pa., and by David R. Howes, executor, Baltimore, Md., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 24, 1980, Ser. No. 143,228

Int. Cl.³ C07D *487/04*; A61K *31/505*

U.S. Cl. 544—250 **11 Claims**

1. A compound of the general formula:



or a non-toxic acid addition salt thereof,

wherein:

R is phenyl, 4-nitrophenyl, 4-methylphenyl, 4-t-butylphenyl, 4-methoxyphenyl, 4-chlorophenyl, 4-(acetylamino)phenyl, 3-(trifluoromethyl)phenyl, 3,4-dichlorophenyl, or 2-naphthyl.

4,288,596

FUROINDOLES

Tsutomu Kameyama, Nagoya, Japan, assignor to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

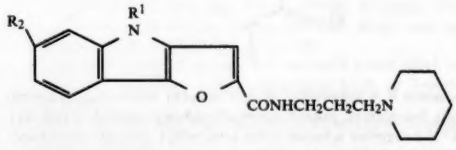
Filed Oct. 9, 1979, Ser. No. 82,728

Claims priority, application Japan, Mar. 31, 1978, 53-37874

Int. Cl.³ C07D *491/048*

U.S. Cl. 546—198 **3 Claims**

1. A furoindole compound of the formula



wherein R¹ is hydrogen or lower alkyl having 1–3 carbon atoms, and R² is hydrogen, trifluoromethyl, methoxy or methyl.

4,288,597

1,2-DIACYLAMINO-1,2-DI(4-PYRIDYL)ETHANES AND PROCESS FOR PRODUCING THEREOF

Miguel F. Brana; Maria L. Lopez Rodriguez; Jose M. Castellano Berlanga; Jose L. Soto Camara, and Cristobal Martinez Roldan, all of Madrid, Spain, assignors to Laboratorios Made, S.A., Madrid, Spain

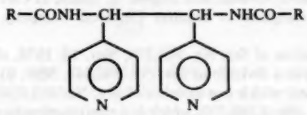
Filed Mar. 10, 1980, Ser. No. 128,427

Claims priority, application Spain, Apr. 26, 1979, 479.959

Int. Cl.[3] C07D *401/06*

U.S. Cl. 546—265 22 Claims

1. A compound of the formula



where R is an alkyl group of 1 to 7 carbon atoms; a phenyl group which may be substituted with an alkyl group of 1 to 4 carbon atoms, halogen, trifluromethyl, methoxy, methylsulfonyl or nitro; benzyl or diphenyl.

4,288,598

PYRIDINE-2,3,6-TRIONES

William E. Long, Brentwood, England, assignor to Ciba-Geigy AG, Basel, Switzerland

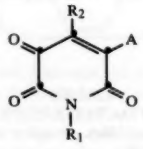
Filed Feb. 22, 1980, Ser. No. 123,867

Claims priority, application United Kingdom, Mar. 26, 1979, 10539/79

Int. Cl.[3] C07D *213/56, 213/57*

U.S. Cl. 546—288 5 Claims

1. A compound of the general formula



(I)

wherein A is cyano or carboxamide and R_1 and R_2 are hydrogen, alkyl of 1 to 6 carbon atoms or alkyl of 1 to 6 carbon atoms substituted by a substituent selected from the group consisting of hydroxy, halogen and alkoxy of 1 to 4 carbon atoms, phenyl or phenyl substituted by a substituent selected from the group consisting of hydroxy, halogen, alkyl of 1 to 4 carbon atoms and alkoxy of 1 to 4 carbon atoms.

4,288,599

PROCESS FOR PRODUCING PYRIDINE DERIVATIVES HAVING A TRIFLUOROMETHYL GROUP AT β-POSITION THEREOF

Ryuzo Nishiyama, Takatsuki; Kanichi Fujikawa, Moriyama; Isao Yokomichi, Moriyama; Yasuhiro Tsujii, Moriyama, and Shigeyuki Nishimura, Shiga, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

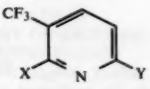
Filed Feb. 26, 1980, Ser. No. 124,757

Claims priority, application Japan, Mar. 9, 1979, 54/27369; Apr. 12, 1979, 54/44733; Oct. 22, 1979, 54/136057

Int. Cl.[3] C07D *213/26*

U.S. Cl. 546—345 17 Claims

8. A process for producing a pyridine derivative having a trifluoromethyl group at the β-position thereof and having the formula:



wherein X and Y, respectively, are hydrogen or chloro which comprises reacting β-picoline with chlorine and hydrogen fluoride by a vapor phase reaction in the presence of a catalyst comprising a fluoride of a metal selected from the group consisting of aluminum, chromium, iron, nickel, cobalt, manganese, chromium with aluminum, iron with aluminum, manganese with aluminum, and cobalt with aluminum.

4,288,600

PREPARATION OF 2-CHLORO-5-TRIFLUOROMETHYLPYRIDINE AND 2-CHLORO-5-PERCHLOROFLUOROMETHYLPYRIDINES

Norman L. Roberts, Walton, and Graham Whittaker, Frodsham, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 22, 1980, Ser. No. 143,479

Claims priority, application United Kingdom, Dec. 7, 1978, 47583/78

Int. Cl.[3] C07D *213/26*

U.S. Cl. 546—345 5 Claims

1. A process for the selective preparation of 2-chloro-5-trifluoromethylpyridine or a 2-chloro-5-perchlorofluoromethylpyridine which comprises vaporizing 3-trifluoromethylpyridine or perchlorofluoromethylpyridine respectively and chlorinating the vaporized 3-trifluoromethylpyridine or perchlorofluoromethylpyridine by contacting the same in the vapor phase with gaseous chlorine in the range of 300° C. to 450° C., condensing the resulting reaction mixture and recovering the desired product from the condensate.

4,288,601

FLUORINATION PROCESS

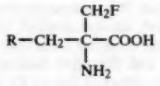
Janos Kollonitsch, Westfield, and Stephen Marburg, Metuchen, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 939,032, Sep. 1, 1978, Pat. No. 4,215,221, which is a continuation-in-part of Ser. No. 802,389, Jun. 1, 1977, abandoned. This application Sep. 19, 1979, Ser. No. 76,889

Int. Cl.[3] C07C *101/24;* C07D *209/14*

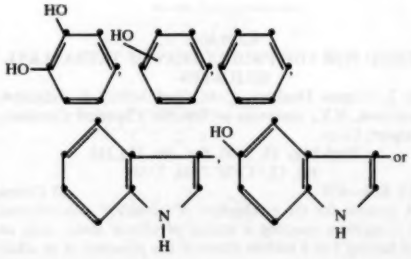
U.S. Cl. 548—344 8 Claims

1. A process for preparing compounds having the formula

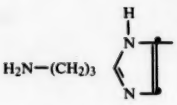


(I)

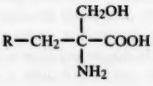
wherein R is



-continued



which comprises reacting a compound having the formula



with (a) SF_4 and (b) BF_3, in liquid HF at temperatures ranging from about −80° C. to about 20° C.

4,288,602

SELECTIVE OXIDATION OF 1,2-DIPHENYL-4-(2-PHENYLTHIO)ETHYL)-3,5-PYRAZOLIDINEDIONE TO THE SULFINYL COMPOUND

George A. Church, Dorval, and Chih H. Chou, Dollard des Ormeaux, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 136,147

Int. Cl.³ C07D *231/63*

U.S. Cl. 548—361 **5 Claims**

1. A process for preparing 1,2-diphenyl-4-[2-(phenylsulfinyl-)ethyl]-3,5-pyrazolidinedione, with only very small amounts of the undesired corresponding sulfone, which comprises oxidizing 1,2-diphenyl-4-[2-(phenylthio)ethyl]-3,5-pyrazolidinedione with peroxymonosulfuric acid.

4,288,603

SILYLATED CATECHOL COMPOSITIONS

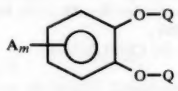
Charles J. Stark, Jr., Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,036

Int. Cl.³ C07F *7/08, 7/10, 7/18*

U.S. Cl. 556—422 **8 Claims**

1. A composition of matter having the general formula



where Q is independently selected from the class consisting of Si—R_3 or hydrogen and, R is independently selected from the class carbon atoms, aryl, alkaryl, aralkyl, vinyl, and allyl radicals, A is independently selected from alkyl radicals the same as R above, halogen and the nitro radical, where A can be ortho-, meta or para- to either of the —OQ radicals, and m is an integer from 1 to 2 inclusive, with the proviso, that only one Q can be hydrogen, and only one R can be hydrogen on any one silicon atom.

4,288,604

METHOD FOR THE PRODUCTION OF TETRAALKYL SILICATES

Walter L. Magee, Danbury, Conn., and Jeffrey E. Telschow, Tarrytown, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 19, 1980, Ser. No. 151,226

Int. Cl.³ C07F *7/04, 7/18*

U.S. Cl. 556—470 **23 Claims**

1. A process for the production of tetraalkyl orthosilicates which comprises reacting a source of silicon metal with an alkanol having 1 to 6 carbon atoms in the presence of an alkali metal salt of a high-boiling alcohol selected from the group consisting of compounds of the formula $R''O(CHR'''CH_2O)_nH$ where R'' is hydrogen, ethyl, butyl, methyl, propyl, hexyl, cyclohexyl, or 2-ethylhexyl, R''' is hydrogen or methyl, n is equal to 2, 3, or 4, their isomers or mixtures thereof.

4,288,605

CYCLOHEXANE CARBONYLOXYBROMOACETANILIDE

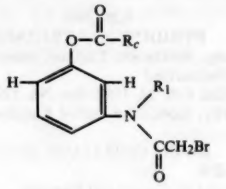
Don R. Baker, Orinda, and Eugene G. Teach, El Cerrito, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 960,378, Nov. 13, 1978, abandoned, which is a division of Ser. No. 560,843, Mar. 21, 1975, abandoned, which is a division of Ser. No. 311,034, Nov. 30, 1972, Pat. No. 3,898,273, which is a continuation-in-part of Ser. No. 127,760, Mar. 24, 1971, abandoned, which is a division of Ser. No. 806,717, Mar. 12, 1969, abandoned. This application Jan. 15, 1980, Ser. No. 112,252

Int. Cl.³ C07C *69/75;* A01N *37/08*

U.S. Cl. 560—1 **1 Claim**

1. A compound having the formula



in which R_c is cyclohexyl and R_1 is hydrogen.

4,288,606

ESTERS OF PROSTACYCLIN-TYPE COMPOUNDS

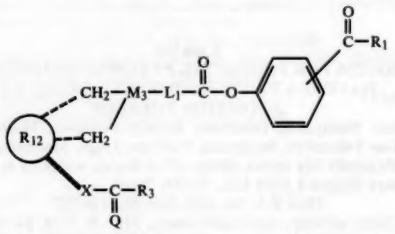
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 48,496, Jun. 14, 1979, Pat. No. 4,236,019, which is a division of Ser. No. 933,329, Aug. 14, 1978, Pat. No. 4,180,657. This application Feb. 15, 1980, Ser. No. 121,844

Int. Cl.³ C07C *177/00*

U.S. Cl. 560—8 **1 Claim**

1. An acid ester of a 6a-carba prostacyclin analog of the formula



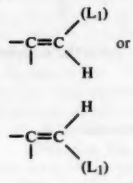
wherein L_1 is

(1) $—(CH_2)_n—$ wherein n is one to 5, inclusive,

(2) $—(CH_2)_p—$ wherein p is 2, 3, or 4, or

(3) $—(CH_2)_v—CH=CH—$ wherein v is 1, 2, or 3,

wherein M_3 is

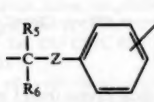


(1)

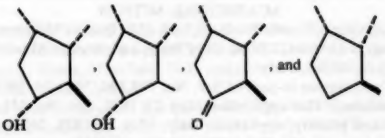
(2)

wherein Q is oxo, α-H:β-H, α-OH:β-R4, or α-R4:β-OH, wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, wherein R_1 alkyl of one to 4 carbon atoms with the proviso that when R_1 is tert-butyl the group

is in the 4-position,
wherein R_3 is



wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—);
wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms; inclusive, fluoro, chloro, trifluoromethyl, or —OR_7— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different.
wherein R_{12} is



wherein X is
(1) trans—CH=CH—
(2) cis—CH=CH—
(3) —C≡C— or
(4) —CH_2CH_2—.

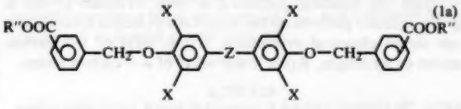
4,288,607

BIS-CARBALKOXY COMPOUNDS AND THEIR PREPARATION

Gerhard Bier, Troisdorf; Dagmar Kottek, Sieburg; Egon N. Petersen, Neukirchen-Seelscheid; Hermann Richtzenhain, Much-Schwellenbach, and Norbert Vollkommer, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

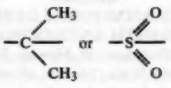
**Division of Ser. No. 733,820, Oct. 19, 1976, Pat. No. 4,152,511.
This application Mar. 12, 1979, Ser. No. 19,944
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1975, 2547802; Mar. 26, 1976, 2612840; Mar. 26, 1976, 2612841; Mar. 26, 1976, 2612842; Jul. 23, 1976, 2633096
Int. Cl.[3] C07C *147/107;* C08C *63/18***
U.S. Cl. 560—11 **6 Claims**

1. Bis-(carbalkoxy-benzyl)-ether of bisphenols of the formula



(1a)

wherein X represents bromine, chlorine or hydrogen, -R"- represents alkyl of 1 to 6 carbon atoms and Z represents the groups

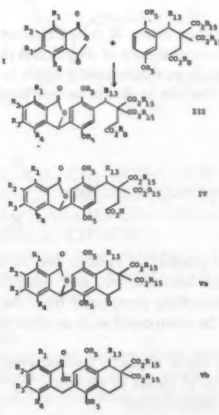


4,288,608

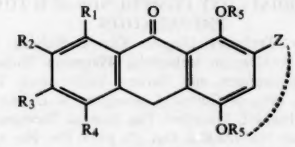
SYNTHESIS OF ANTHRACYCLINES

Francis Johnson, Setauket, N.Y., and Kyoung S. Kim, Jeonam, D.P.R. of Korea, assignors to Research Corporation, New York, N.Y.

**Division of Ser. No. 911,709, Jun. 1, 1978, Pat. No. 4,196,127.
This application Nov. 5, 1979, Ser. No. 91,348
Int. Cl.[3] C07C *69/95***
U.S. Cl. 560—53 **2 Claims**



1. A compound of the formula



and the enol forms thereof wherein R_1,R_2, R_3, and R_4 may also be the same or different and are each selected from the group consisting of hydrogen, alkyl, alkoxy, and halo, R_5 is alkyl wherein the alkyl and alkoxy moieties contain 1–5 carbon atoms, Z is

$$—CR_{13}H.C(COOR_{15})_2\,(CH_2)_2—$$

wherein the bondings indicated at both terminals of the Z group indicate position on the ring of the principal formula, but not stereo chemical orientation, R_{13} is alkyl of 1–5 carbon atoms or hydrogen, R_{15} is lower alkyl of 2–6 carbon atoms.

4,288,609

QUATERNARY AMMONIUM DERIVATIVES OF ADAMANTANE WITH ANTIMICROBIC ACTIVITY

Luigi Rovati, San Fruttuoso di Monza; Francesco Makovec, Taccona, and Paolo Senin, Monza, all of Italy, assignors to Rotta Research Laboratorium S.p.A., San Fruttuoso di Monza, Italy

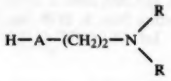
Continuation of Ser. No. 853,591, Nov. 21, 1977, abandoned. This application Dec. 4, 1979, Ser. No. 100,065

Claims priority, application Italy, Nov. 24, 1976, 69791 A/76

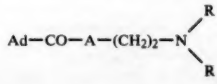
Int. Cl.[3] **C07C** *67/08, 102/04*

U.S. Cl. 560—117 **3 Claims**

1. Process for the preparation of a quaternary ammonium salt having antibacterial, fungicidal and antiprotozoic activity, comprising reacting at 5° C. to 30° C. for 12–48 hours 1-carboxy-adamantane with a compound of the formula:



in which A is oxygen atom, R is $—CH_3$(methyl) or $—C_2H_5$(ethyl) group, in the presence of dicyclohexylcarbodiimide or carbonyl diimidazole as a condensing agent in anhydrous acetone as a solvent, thereby to obtain an intermediate compound:

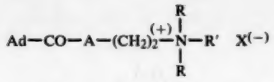


in which Ad is 1-adamantyl radical, and A and R have the meaning indicated hereinbefore, and subsequently, without isolating the intermediate compound from the reaction ambient, quaternising the compound with an alkyl halide of formula R′-X, in which:

R′ represents a linear aliphatic hydrocarbon chain containing from 10 to 12 atoms of carbon,

X represents a halide atom,

thereby to obtain the said quaternary ammonium salt having the formula:



in which Ad, R, R′ and X^- have the meanings stated above.

4,288,610

PURIFICATION OF PYRETHROID INTERMEDIATE COMPOUNDS BY SELECTIVE PARTIAL SAPONIFICATION

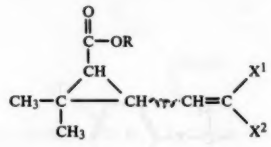
Edmund J. Rumanowski, Dover, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 25, 1980, Ser. No. 123,879

Int. Cl.[3] **C07C** *67/60, 69/743, 69/747*

U.S. Cl. 560—124 **7 Claims**

1. A process for removing saponifiable impurities from a composition comprising said saponifiable impurities and a pyrethroid intermediate compound represented by the structural formula:



wherein R is an alkyl radical having from 1 to about 30 carbon atoms and wherein X^1 and X^2 are each independently selected from the group consisting of fluorine, bromine, chlorine and alkyl having from 1 to about 10 carbon atoms and wherein said saponifiable impurities comprise the maleate and fumerate esters of R, which comprises reacting said composition with a dilute aqueous base in an amount and under conditions sufficient to selectively saponify said saponifiable impurities so that they become soluble in said aqueous base, and separating said pyrethroid intermediate compound from said aqueous base.

4,288,611

N-METHYL-CARBAMATES OF 3,5-DIMETHYL-4-(N′-MONOSUBSTITUTED)-AMINO-PHENOLS EXERTING AN INSECTICIDAL AND ACARICIDAL ACTION

Franco Gozzo; Paride Paolucci, both of S. Donato Milanese, and Angelo Longoni, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 909,304, May 24, 1978, abandoned. This application May 21, 1980, Ser. No. 151,819

Claims priority, application Italy, May 26, 1977, 24031 A/77

Int. Cl.[3] **C07C** *125/04, 125/067*

U.S. Cl. 560—133 **4 Claims**

1. N-methyl-carbamate of 3,5-dimethyl-4-(N′allylamino)-phenol.

4. N-methyl-carbamate of 3,5-dimethyl-4-(N′-benzylamino)-phenol.

4,288,612

DEPOSIT CONTROL ADDITIVES

Robert A. Lewis, Berkeley, and Lewis R. Honnen, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 917,427, Jun. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 891,879, Mar. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 801,444, May 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 730,495, Oct. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 700,922, Jun. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 698,243, Jun. 21, 1976, abandoned. This application Apr. 28, 1980, Ser. No. 144,797

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.[3] C07C *125/04;* C10L *1/22*

U.S. Cl. 560—159 12 Claims

1. A hydrocarbylpoly(oxyalkylene) aminocarbamate having a molecular weight of about 600–10,000 and at least one primary or secondary amino group; wherein said hydrocarbylpoly(oxyalkylene) moiety is composed of oxyalkylene units selected from C_2–C_5 oxyalkylene units of which a sufficient number are branched-chain oxyalkylene units to render said carbamates soluble in liquid hydrocarbons; said hydrocarbyl group contains from 1 to 30 carbon atoms; and said amine moiety is derived from an ethylene diamine from 1 to 24 carbon atoms.

4,288,613

CYCLOPENTANONE SYNTHESIS

Richard C. Larock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

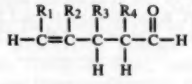
Filed Dec. 3, 1979, Ser. No. 99,321

Int. Cl.[3] C07C *69/03, 45/54*

U.S. Cl. 560—231 8 Claims

1. A method of synthesis of cyclopentanones comprising: cyclizing a 4-pentenal in the presence of a catalytically effective amount of a cyclizing halo rhodium parasubstituted triarylphosphine catalyst and in the presence of a suitable organic solvent for said pentenal and catalyst.

7. The process of claim 1 wherein said pentenal has the general formula of



wherein R_1, R_2, R_3 and R_4 may be the same or different, and R_1 and R_2 are selected from the group consisting of hydrogen, and unsubstituted alkyl, alkenyl, alkynyl, aryl, aralkyl, alkoxy and acyloxy groups, and wherein R_3 and R_4 may be the same as R_1 and R_2, and may in addition be any other organic moiety.

4,288,614

PROCESS FOR THE PREPARATION OF ESTERS OF 5-FORMYL-3-METHYL-2,4-PENTADIEN-1-OL

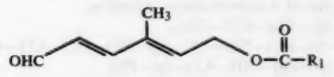
Gary L. Olson, Westfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 9,218, Feb. 5, 1979, Pat. No. 4,222,943, which is a division of Ser. No. 772,711, Feb. 28, 1977, Pat. No. 4,152,520, which is a division of Ser. No. 594,386, Jul. 9, 1975, abandoned. This application Feb. 6, 1980, Ser. No. 118,942

Int. Cl.[3] C07C *67/24*

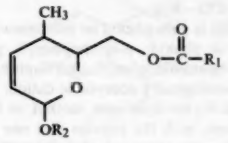
U.S. Cl. 560—240 3 Claims

1. A process for preparing a compound of the formula:



wherein R_1 is lower alkyl;

which comprises treating a compound of the formula:



wherein R_1 is as above and R_2 is lower alkyl,

with a catalytic amount of an amine hydrohalide at a temperature of from about 80° C. to about 200° C., said treatment being conducted in a polar aprotic solvent.

4,288,615

PROCESS FOR RECOVERING 3-NITROBENZOIC ACID

John H. Bright, Kendall Park, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 21, 1980, Ser. No. 122,957

Int. Cl.[3] C07C *51/43*

U.S. Cl. 562—434 10 Claims

1. A process for the recovery of 3-nitrobenzoic acid from a mixture of 2-, 3-, and 4-nitrobenzoic acids comprising adding to the mixture an aqueous solution of a suitable base to form a solution having a pH of about 8–12, adding a suitable acid to lower the pH to about 1.5–3.5 and precipitate 3-nitrobenzoic acid as a slurry, and recovering said 3-nitrobenzoic acid.

4,288,616

13,14-DIDEHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGF$_2$ COMPOUNDS

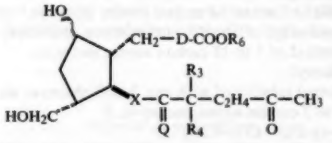
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,961

Int. Cl.[3] C07C *177/00*

U.S. Cl. 562—503 4 Claims

1. A compound of the formula



wherein D is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,

(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,

(3) cis—CH_2—CH=CH—CH_2—CH_2—, or

(4) trans—$(CH_2)_3$—CH=CH—;

wherein g is zero, one, two, or three;

wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;

wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

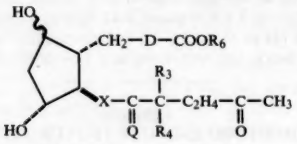
4,288,617

13,14-DIDEHYDRO-19-OXO-PGF$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,973
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or
(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—CH_3,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—CH_3,
(k) —(p-Ph)—NH—CO—NH_2,
(l) —(p-Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

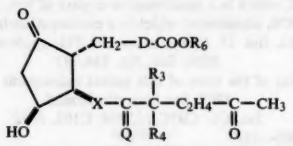
4,288,618

19-OXO-PGF$_2$ ANALOGS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,220
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—;
wherein g is zero, one, two, or three; wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl; wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) -(p—Ph)—CO—CH_3,
(h) -(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) -(p—Ph)—NH—CO—(p—Ph),
(j) -(p—Ph)—NH—CO—CH_3,
(k) -(p—Ph)—NH—CO—NH_2,
(l) -(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and wherein X is cis— or trans—CH=CH—; with the proviso that R_6 is not hydrogen or alkyl of one to 12 carbon atoms, inclusive, when Q is α—OH:β—H, R_2 is hydroxy, R_3 and R_4 are hydrogen or methyl and D is cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—.

4,288,619

PROCESS FOR THE RECOVERY OF α-HYDROXY- AND α-AMINO-CARBOXYLIC ACIDS FROM SUGAR-CONTAINING MEDIA

Francis Devos, and Michel Huchette, both of Lestrem, France, assignors to Roquette Freres, France

Filed Aug. 30, 1979, Ser. No. 71,371
Claims priority, application France, Aug. 31, 1978, 78 25239
Int. Cl.^{3} C07C *51/00, 51/42, 99/00*
U.S. Cl. 562—554 **13 Claims**

1. Process for recovering α-hydroxy- and α-amino-carboxylic acids in the form of their calcium salts from sugary media containing them, wherein:
in the first step, said sugary media containing an α-hydroxy- or α-amino-carboxylic acid in the form of its calcium salt is contacted with a cationic resin in the calcium form for a sufficient time to achieve an optimal adsorption of said calcium salt and then,
in a second step, the previously saturated resin is eluted by water to provide first fractions enriched in sugar and then latter fractions enriched essentially in an α-hydroxy- or α-aminocarboxylic acid in the form of its calcium salt,

recovering thus the said acid in the form of its calcium salt.

4,288,620

PROCESS FOR THE PRODUCTION OF 4-ACYLAMIDO-2-NITRO-1-ALKOXYBENZENES

Manfred Rosner, Muttenz, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Jun. 12, 1980, Ser. No. 158,977

Claims priority, application Switzerland, Jun. 21, 1979, 5806/79

Int. Cl.³ C07C *102/00, 102/04*

U.S. Cl. 564—144 **8 Claims**

1. A process for the production of 4-acylamido-2-nitro-1-alkoxybenzenes by acylating p-alkoxyaniline with an acylating agent to 4-acylamido-alkoxybenzenes and subsequently nitrating these latter to 4-acylamido-2-nitro-1-alkoxybenzenes, which process comprises carrying out the reaction in an inert solvent, without isolation of the intermediates, using 88 to 95% sulfuric acid in the weight ratio of 6:1 to 10:1, based on the p-alkoxyaniline employed, during the nitration step.

4,288,621

SUBSTITUTED 2,2-DIMETHYLCYCLOPROPANEAMIDES

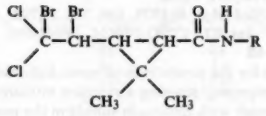
Gustave K. Kohn, and Ted A. Baer, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 102,050, Dec. 10, 1979, Pat. No. 4,254,264. This application Jun. 2, 1980, Ser. No. 155,262

Int. Cl.³ C07C *103/19*

U.S. Cl. 564—190 **1 Claim**

1. A compound of the following formula:



wherein, R is hydrogen or methyl.

4,288,622

N,N-DIALKYLAMINO DIPHENYLAMINES AND THE USE THEREOF IN COMPOSITIONS FOR DYEING KERATINIC FIBERS

Gregoire Kalopissis, Neuilly-sur-Seine; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 551,653, Feb. 21, 1975, Pat. No. 4,008,999. This application Nov. 12, 1976, Ser. No. 741,495

Claims priority, application Luxembourg, Feb. 22, 1974, 69459

Int. Cl.³ C07C *91/42;* D06P *1/32*

U.S. Cl. 564—194 **4 Claims**

1. 3,2',6'-trimethyl-4-hydroxy-6-amino-4'-N,N-dimethylamino diphenylamine.

4. 3,5-dimethyl-4-hydroxy-2-acetylamino-4'-dimethylamino diphenylamine.

4,288,623

1-ARYL-4-AMINO-CYCLOHEXAN-1-OLS

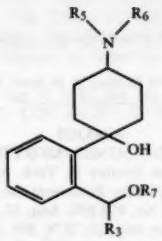
Lawrence L. Martin, Lebanon, N.J., and Manfred Worm, Wiesbaden-Naurod, Fed. Rep. of Germany, assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 73,055, Sep. 6, 1979, Pat. No. 4,263,317. This application Nov. 28, 1980, Ser. No. 211,148

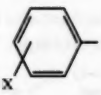
Int. Cl.³ C07C *87/452*

U.S. Cl. 564—307 **4 Claims**

1. A compound of the formula



wherein R_3 is loweralkyl or



wherein X is hydrogen, halogen or loweralkyl; R_5 and R_6 are loweralkyl; R_7 is hydrogen or loweralkyl; and the geometrical isomers and optical antipodes thereof.

4,288,624

ACYLATION OR SULFENYLATION PROCESS

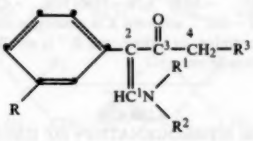
Riaz F. Abdulla, Greenfield, and Lawrence A. Morgan, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 21, 1980, Ser. No. 179,584

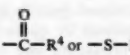
Int. Cl.³ C07C *85/24;* C07D *295/08, 295/10*

U.S. Cl. 564—345 **21 Claims**

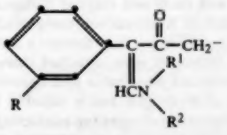
1. A process for preparing a compound of the formula



wherein R is chloro, bromo, fluoro or trifluoromethyl; R^1 and R^2 are independently C_1–C_3 alkyl, or R^1 and R^2 combine with the nitrogen atom to which they are attached to form pyrrolidino, piperidino, morpholino or N-methylpiperazino; R^3 is



R^4 is C_1–C_4 alkyl, phenyl, C_1–C_2 alkyl monosubstituted with methoxy, or phenyl monosubstituted with chloro, bromo, fluoro or trifluoromethyl; R^5 is C_1–C_3 alkyl, C_1–C_3 fluoroalkyl, phenyl, benzyl, or phenyl substituted with C_1–C_3 alkyl, C_1–C_3 alkoxy or halo; which process comprises reacting an anion of the formula



with a compound of the formula

wherein X is chloro or bromo, in an inert organic solvent.

4,288,625

DINITRILES, DIAMINES, AND POLYAMIDES

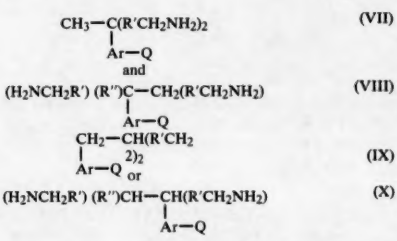
Charles A. Drake, and Stanley D. Turk, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Continuation of Ser. No. 499,660, Aug. 22, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 716,406

Int. Cl.[3] C07C *85/12*

U.S. Cl. 564—372 **21 Claims**

1. As compositions of matter, aralkylenediamines represented by:



(VII)

and

(VIII)

(IX)

or

(X)

wherein each R′ is an alkylene or alkylidene radical of at least one carbon atom, R″ is an alkyl radical of at least one carbon atom, and Ar is a divalent phenylene or naphthylene radical wherein Q represents hydrogen or other substituent on said Ar, and wherein said —Ar—Q contains 6 to 22 carbon atoms, and wherein Q is selected from the group consisting of —H, —X, —R‴, —N(R‴)$_2$, —NH$_2$′HX, —OR‴, —SH, —OH, and —SR‴, wherein X is a halogen and is fluorine, chlorine, bromine, or iodine, and R‴ is an alkyl radical of 1 to 6 carbon atoms.

4,288,626

PROCESS FOR HYDROGENATION OF UNSATURATED DINITRILES

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 5, 1980, Ser. No. 184,520

Int. Cl.[3] C07C *85/12, 85/26, 121/20, 121/28*

U.S. Cl. 564—491 **9 Claims**

1. In a process for producing saturated diamines or dinitriles from an olefinically unsaturated dinitrile feedstock comprising the reaction product obtained by contacting under suitable reaction conditions for producing said unsaturated dinitrile reactants consisting essentially of at least one olefinically unsaturated mononitrile reactant and at least one monoadduct reaction product of an olefinic hydrocarbon compound and an olefinically unsaturated mononitrile compound wherein each said olefinically unsaturated mononitrile reactant and each said olefinically unsaturated mononitrile compound contain a cyano group attached to a carbon atom adjacent and doubly bonded to a carbon atoms which is attached to at least one hydrogen atom and each said olefinic hydrocarbon reactant and each said olefinic hydrocarbon compound have at least one olefinic linkage having joined thereto a carbon atom having at least one hydrogen atom attached thereto comprising subjecting the feedstock to suitable hydrogenation conditions in the presence of hydrogen and a suitable hydrogenation catalyst, the improvement comprising contacting the feedstock with a crystalline zeolite so as to extend the activity of said hydrogenation catalyst.

4,288,627

OXIDATION OF THIOLS EMPLOYING COBALT MOLYBDATE/TRIETHYLAMINE CATALYST

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 12, 1980, Ser. No. 120,812

Int. Cl.[3] C07C *149/12*

U.S. Cl. 568—26 **7 Claims**

1. A process for the conversion of a thiol represented by the formula

wherein R, R^1, and R^2 can be hydrogen, alkyl, or cycloalkyl containing from 1 to 20 carbon atoms, R and R^1 taken together can be an alkylene radical having from 5 to 10 carbon atoms to a corresponding disulfide which comprises subjecting the same to oxidation conditions including air or oxygen-containing gas in the presence of a cobalt oxide molybdenum oxide catalyst on a support and a liquid tertiary amine represented by the formula

where R^3 can be any alkyl radical having 1 to 6 carbon atoms.

4,288,628

PROCESS FOR THE PRODUCTION OF MONO-HALOTHIOPHENOLS AND THIOPHENOLS

Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 8, 1979, Ser. No. 18,708

Int. Cl.[3] C07C *149/34, 149/28*

U.S. Cl. 568—65 **16 Claims**

1. A process for the production of mono-halothiophenol and thiophenol comprising reacting a reactant mixture of benzene and dihalobenzene with hydrogen sulfide in the presence of an absorptive catalyst having a surface area of from about 1 to about 1,000 square meters per gram and selected from the group consisting of:

activated carbon,
petroleum coke,
charcoal,
calcined petroleum coke,
alumina,
clay,
silica gel, and
molecular sieves.

4,288,629

1-HYDROXYMETHYL-11-DEOXY-15-HYDROXY-PROSTEN-1-OL-DERIVATIVES

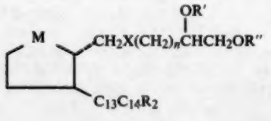
Allan Wissner, Ardsley, and Middleton B. Floyd, Jr., Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 3, 1980, Ser. No. 137,042

Int. Cl.[3] C07C *35/06, 49/597, 49/798*

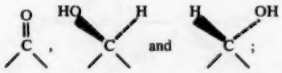
U.S. Cl. 568—330 **30 Claims**

1. A compound of the formula



wherein

M is a radical selected from the group

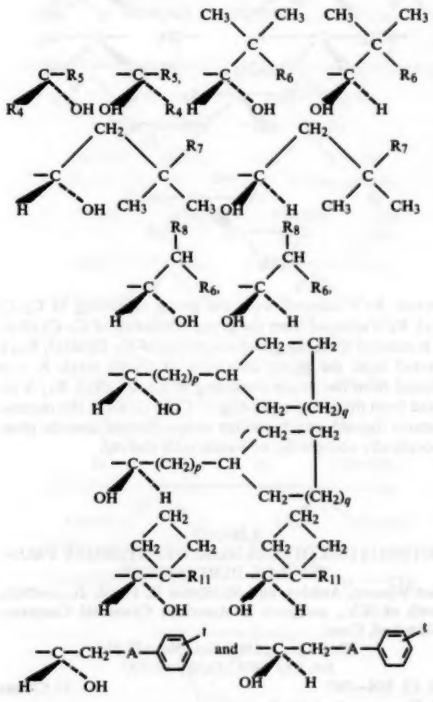


X is —CH=CH—(cis) and —CH=CH—(trans);

R′ and R″ are the same or different and are hydrogen, C_1 to C_6 alkanoyl or optionally substituted benzoyl, the substituents selected from the group

C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halo and trifluoromethyl;

$C_{13}C_{14}$ is selected from the group —CH=CH—(trans) and —CH_2—CH_2—; and R_2 is selected from the group wherein R_2 is selected from the group



wherein R_4 is hydrogen or methyl; R_5 is selected from the group consisting of C_4 to C_7 alkyl; R_6 is selected from the group consisting of C_3 to C_6 alkyl; R_7 is selected from the group consisting of C_2 to C_4 alkyl; R_8 is selected from the group consisting of C_1 to C_2 alkyl; R_{11} is selected from the group consisting of C_3 to C_7 alkyl; A is a divalent radical selected from —CH_2— and —O—; p is an integer from 0 to 3; q is the integer 1 or 2; t is selected from the group consisting of hydrogen, chloro, fluoro, dichloro, trifluoromethyl and methoxy; and n is the integer 3, 4 or 5.

4,288,630

1-HYDROXYMETHYL-11,15-DIHYDROXY-PROSTEN-1-OL-DERIVATIVES

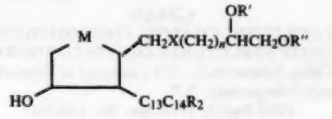
Allan Wissner, Ardsley, and Middleton B. Floyd, Jr., Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 3, 1980, Ser. No. 137,084

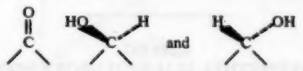
Int. Cl.[3] **C07C** *49/597, 35/06, 49/798*

U.S. Cl. 568—330 **34 Claims**

1. Compounds of the formula



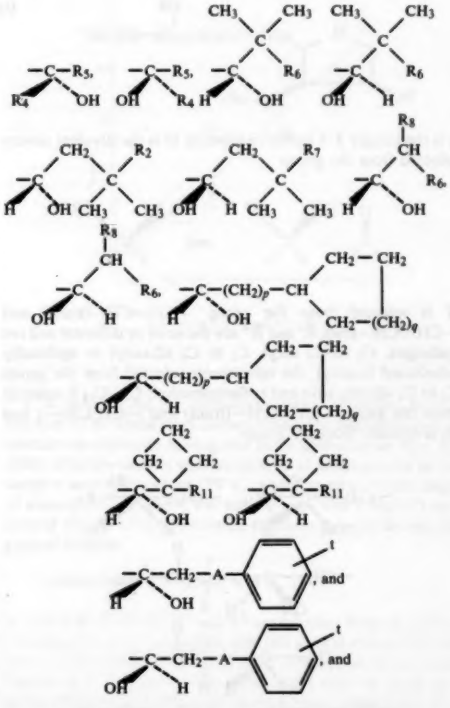
wherein M is a radical selected from the group



X is —CH_2CH_2—;

R′ and R″ are the same or different and are hydrogen, C_1 to C_4 alkanoyl or optionally substututed benzoyl, the substituents selected from the group C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halo and trifluoromethyl;

$C_{13}C_{14}$ is selected from the group —CH=CH—(trans) and —CH_2—CH_2—; and R_2 is selected from the group



wherein R_4 is hydrogen or methyl; R_5 is selected from the group consisting of C_4–C_7 alkyl; R_6 is selected from the group

consisting of C_3–C_6 alkyl; R_7 is selected from the group consisting of C_2–C_4 alkyl; R_8 is selected from the group consisting of C_1–C_2 alkyl; R_{11} is selected from the group consisting of C_3–C_7 alkyl; A is a divalent radical selected from —CH_2— and —O—; p is an integer from 0 to 3; q is the integer 1 or 2, t is selected from the consisting of hydrogen, chloro, fluoro, dichloro, trifluoromethyl and methoxy; and n is the integer 3, 4 or 5, the racemic mixtures thereof and the individual optically active enantiomers thereof.

4,288,631

UV STABILIZERS, COATING COMPOSITIONS AND COMPOSITE STRUCTURES OBTAINED THEREFROM

Ta-Yen Ching, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1979, Ser. No. 100,441
Int. Cl.³ C07C *49/245;* B32B *9/04*
U.S. Cl. 568—333 **2 Claims**

1. 2,4-dihydroxy-4'-methoxy-3-methylbenzophenone.

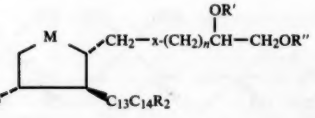
4,288,632

1-HYDROXYMETHYL-11,16-DIHYDROXY-PROSTEN-1-OL DERIVATIVES

Allan Wissner, Ardsley, and Middleton B. Floyd, Jr., Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

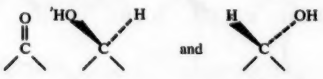
Filed Apr. 3, 1980, Ser. No. 137,030
Int. Cl.³ C07C *35/06, 49/597*
U.S. Cl. 568—367 **123 Claims**

1. Compounds of the formula:

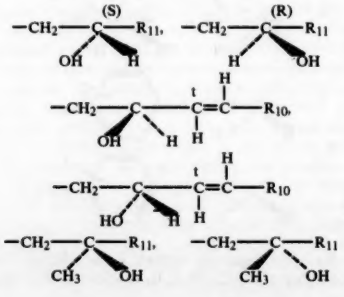


(I)

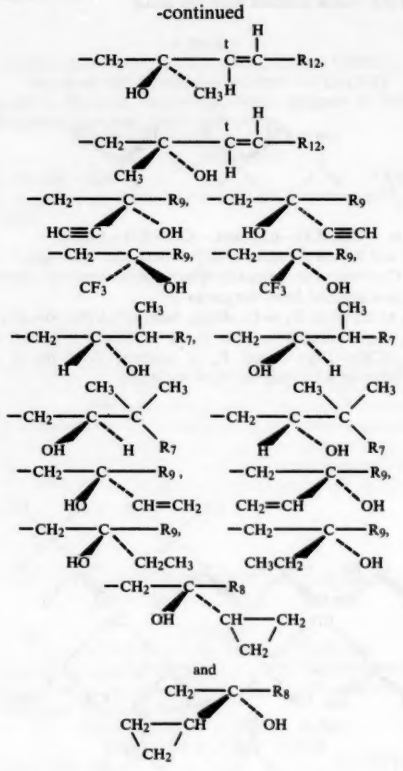
n is the integer 3–5 inclusive;wherein M is the divalent moiety selected from the group



X is selected from the group —CH=CH—(trans) and —CH=CH—(cis); R' and R" are the same or different and are hydrogen, C_1 to C_4 alkyl, C_1 to C_6 alkanoyl or optionally substituted benzoyl, the substituents selected from the group C_1 to C_4 alkoxy, halo and trifluoromethyl; C_{13}–C_{14} is selected from the group —CH=CH—(trans) and —CH_2CH_2—; and R_2 is selected from the group



-continued



wherein R_7 is selected from the group consisting of C_2–C_4 alkyl; R_8 is selected from the group consisting of C_1–C_2 alkyl; R_9 is selected from the group consisting of C_3–C_6 alkyl; R_{10} is selected from the group consisting of C_1–C_4 alkyl; R_{11} is selected from the group consisting of C_3–C_7 alkyl; R_{12} is selected from the group consisting of C_1 to C_4 alkyl; the racemic mixtures thereof; and the mirror images thereof, and the pharmaceutically acceptable, non-toxic salts thereof.

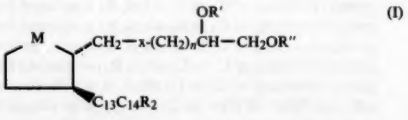
4,288,633

1-HYDROXYMETHYL-11-DEOXY-16-HYDROXY-PROSTEN-1-OL-DERIVATIVES

Allan Wissner, Ardsley, and Middleton B. Floyd, Jr., Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

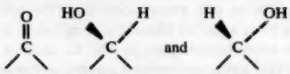
Filed Apr. 3, 1980, Ser. No. 137,031
Int. Cl.³ C07C *35/06, 49/597*
U.S. Cl. 568—367 **52 Claims**

1. Compounds of the formula:

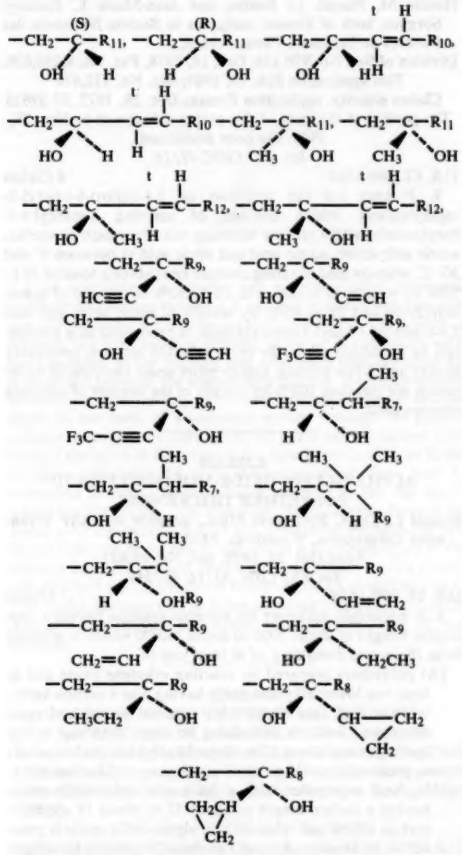


(I)

n is the integer 3–5 inclusive; wherein M is the divalent moiety selected from the group



X is $-CH_2CH_2-$, and; R' and R'' are the same or different and are hydrogen, C_1 to C_4 alkyl, C_1 to C_6 alkanoyl or optionally substituted benzoyl, the substituents selected from the group C_1 to C_4 alkoxy, halo and trifluoromethyl; C_{13}–C_{14} is selected from the group $-CH=CH-$(trans) and $-CH_2CH_2-$; and R_2 is selected from the group



R_7 is selected from the group consisting of C_2–C_4 alkyl; R_8 is selected from the group consisting of C_1–C_2 alkyl; R_9 is selected from the group consisting of C_3–C_6 alkyl; R_{10} is selected from the group consisting of C_1–C_4 alkyl; R_{11} is selected from the group consisting of C_3–C_7 alkyl; R_{12} is selected from the group consisting of C_1 to C_4 alkyl the racemic mixtures thereof; and the mirror images thereof, and the pharmaceutically acceptable, nontoxic salts thereof.

4,288,634

NOVEL RHODIUM COMPOUNDS AND PROCESS FOR PRODUCING THE SAME

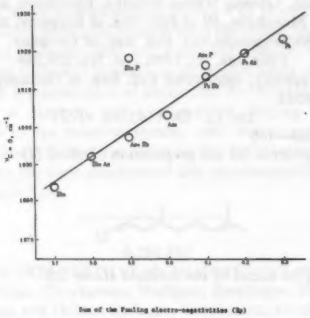
Tadamori Sakakibara; Yoshihisa Matsushima; Yukio Nagashima; Nobukazu Okamoto; Katsumi Kaneko, all of Ooi; Yohio Ishii, Nagoya, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

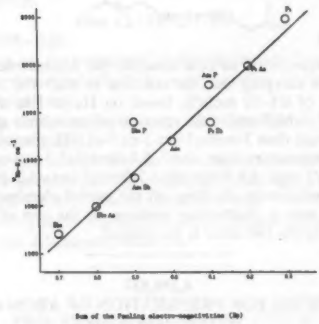
Filed Sep. 7, 1979, Ser. No. 73,664

Claims priority, application Japan, Apr. 10, 1978, 53/121456; Apr. 10, 1978, 53/121457

Int. Cl.[3] **C07C** *45/50*

U.S. Cl. 568—454 **5 Claims**





1. A process for the hydroformylation of olefins by the reaction of an olefin with carbon monoxide and hydrogen to produce an aldehyde having one more carbon atom than the olefin wherein there is used as catalyst at temperatures in the range of ambient to about 150° C., a total pressure in the range of atmospheric to about 100 atmospheres and a H_2/CO mol ratio of 10/1 to 1/10, a preformed rhodium complex having the general formula

$$HRh(CO)(PR^1R^2R^3)_n(AsR^4R^5R^6)_{3-n}$$

in which R^1,R^2,R^3,R^4,R^5 and R^6 are selected from the group consisting of alkyl, cycloalkyl, aryl and aralkyl and may be the same or different and n is 1 or 2, in the presence of excess mixed ligands of P and As having substituents selected from said group which may be the same as or different from those contained in the rhodium complex.

4,288,635
METHOD FOR THE PREPARATION OF (E)-4-BROMO-2-METHYLBUT-2-EN-1-AL

Gary M. Gray, Bethlehem, Pa., assignor to J. T. Baker Chemical Co., Phillipsburg, N.J.

Filed May 23, 1980, Ser. No. 152,700
Int. Cl.³ C07C 47/24
U.S. Cl. 568—483 2 Claims

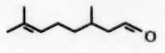
1. A process for the production of (E)-4-bromo-2-methylbut-2-en-1-al comprising reacting 3,4-epoxy-3-methyl-1-butene with cupric bromide in the presence of lithium carbonate.

4,288,636
PREPARATION OF CITRAL

Axel Nissen, Leimen; Walter Rebafka, Eppelheim, and Werner Aquila, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

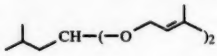
Filed Jun. 10, 1980, Ser. No. 158,346
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1979, 2926562
Int. Cl.³ C07C 45/51, 47/21
U.S. Cl. 568—486 4 Claims

1. In a process for the preparation of citral (I)

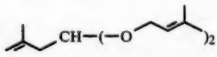


I

by heating an acetal of the formula IIa or IIb



IIa



IIb

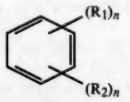
in the presence of an acid catalyst, the improvement which comprises carrying out the reaction at 100°–160° C. in the presence of 0.1–10 mole%, based on IIa or IIb, of an inert liquid IV, which under the reaction pressure boils at a higher temperature than 3-methyl-but-2-en 1-ol (III, prenol) but at a lower temperature than citral, 2,8-dimethyl-5-oxa-nona-1,3,7-triene (V) and 2,4,4-trimethyl-3-formyl-hexa-1,5-diene (VI) while continuously distilling off the prenol eleminated in the reaction over a fractioning column, at the top of which a pressure of 40–140 mbar is maintained.

4,288,637
PROCESS FOR PREPARATION OF AROMATIC HYDROPEROXIDES

Fujihisa Matsunaga, Iwakuni; Yoshiyuki Shinohara, Kashiwa; Isamu Okubo, Ohtake; Takayuki Nakamura, Iwakuni, and Seiichi Tanaka, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 24, 1980, Ser. No. 143,474
Claims priority, application Japan, Apr. 27, 1979, 54-51537
Int. Cl.³ C07C 179/035
U.S. Cl. 568—575 8 Claims

1. A process for the preparation of aromatic hydroperoxides which comprises reacting an aromatic compound represented by the following formula:



wherein R_1 stands for a secondary alkyl group having 3 to 4 carbon atoms, R_2 stands for a primary alkyl group having up to 4 carbon atoms, and n and m are numbers of 1 or 2 with the proviso that the sum of n and m does not exceed 3,

with a molecular oxygen-containing gas in two liquid phases which comprise an oily phase containing the aromatic compound and a basic aqueous phase under agitation at a temperature of from room temperature to 200° C. under a pressure of 1 to 50 Kg/cm^2 gauge, wherein a copper compound catalyst composed of an inorganic salt or organic acid salt of copper which is soluble in the basic aqueous phase is present in the liquid phases at a concentration of 0.005 to 10 ppm as the copper atom, the pH value of the basic aqueous phase is maintained at 7.6 to 10, and the volume ratio of the basic aqueous phase to the oily phase is in the range of from 0.001 to 1.

4,288,638
PROCESS FOR THE SYNTHESIS OF 2,4-DINITRO-6-T-BUTYL-3-METHYLANISOLE, REFERRED TO AS MUSK AMBRETTE

Helene M. Pascal, Le Pontet, and Jean-Marie L. Emeury, Sorgues, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Division of Ser. No. 970,139, Dec. 18, 1978, Pat. No. 4,236,029.
This application Feb. 19, 1980, Ser. No. 122,476
Claims priority, application France, Dec. 29, 1977, 77 39625
The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.
Int. Cl.³ C07C 41/18
U.S. Cl. 568—584 4 Claims

1. Process for the synthesis of 2,4-dinitro-6-t-butyl-3-methylanisole which consists of reacting 3-methyl-6-t-butylanisole with a ternary nitrating mixture which comprises acetic anhydride, acetic acid and nitric acid at between 5° and 30° C. wherein said nitrating mixture consists of a total of 30 to 50% by weight of acetic acid, 20 to 30% by weight of acetic anhydride and 25 to 45% by weight of nitric acid, and said 2,4-dinitro-6-t-butyl-3-methylanisole is recovered as a precipitate by introducing into the crude reaction mixture, preferably slowly and while stirring, one or more small amounts of water which are less than 100% by weight of the amount of nitrating mixture used.

4,288,639
ALPHA-OLEFIN OXIDE-MODIFIED LIQUID POLYETHER THICKENERS

Ronald L. Camp, Riverview, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 22, 1979, Ser. No. 86,837
Int. Cl.³ C07C 43/11, 43/164
U.S. Cl. 568—625 7 Claims

1. A polyether thickener for aqueous systems having a molecular weight of about 1000 to about 25,000 which is selected from the group consisting of at least one of

(A) polyethers prepared by reacting ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one monohydric alcohol active hydrogen compound initiator containing no more than one active hydrogen and about 12 to about 18 aliphatic carbon atoms to prepare a heteric or block copolymer and further reacting said copolymer with at least one alpha-olefin oxide having a carbon length of about 12 to about 18 aliphatic carbon atoms and wherein said alpha-olefin oxide is present in the amount of about 1 to about 20 percent by weight based on the total weight of said thickener, and

(B) polyethers prepared by reacting ethylene oxide with at least one monohydric alcohol active hydrogen compound initiator to prepare a homopolymer and further reacting said homopolymer with at least one alpha-olefin oxide wherein said initiator is an aliphatic or alkylaromatic compound which contains no more than one active hydrogen, has a carbon chain length of about 12 to about 18 aliphatic carbon atoms and wherein said alpha-olefin

oxide has a carbon chain length of about 12 to about 18 aliphatic carbon atoms, and is present in the amount of about 1 to about 20 percent by weight based on the total weight of said thickener.

4,288,640

CARRYING OUT EXOTHERMIC REACTIONS BETWEEN A GAS AND A LIQUID

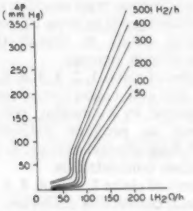
Ludwig Schuster; Paul Raff, both of Ludwigshafen; Herwig Hoffmann, Frankenthal; Rolf Schneider, Mannheim, and Erich Flickinger, Frankweiler, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 63,068, Aug. 12, 1970, abandoned. This application Jul. 22, 1976, Ser. No. 707,499

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1969, 1941633

Int. Cl.[3] C07C *33/046, 33/042, 39/08, 87/52*

U.S. Cl. 568—855 13 Claims



1. In a process for carrying out a solid-catalyst promoted exothermic reaction between a gas and a liquid, wherein the gas and the liquid are conducted cocurrently through a packed column, the solid catalyst serving, alone or in admixture with inert packing, as the packing and wherein a pressure drop Δp is observed between the ends of said column, the improvement which comprises passing an intimate mixture of the gas and the liquid in the form of a turbulent stream through the packed column at such rates that, when the gas flow rate is kept constant, a variation in flow rate of the liquid produces a rise in the pressure difference Δp with increasing liquid flow load L, expressed as Δp/L, at least twice as large as the rise Δp/L under liquid trickling conditions providing laminar flow of the liquid over the packing bodies and continuous gas flow but said liquid flow rate being below the rate at which pulsing Δp in the column is produced, said packing being spheres having diameters of 2 to 8 mm., cylindrical bodies having a length of 2 to 15 mm. and a diameter of 2 to 6 mm. or nonspherical or non-cylindrical bodies having a volume equivalent to that of said spheres.

4,288,641

PROCESS FOR THE PREPARATION OF 1,4-BUTYNEDIOL AND RELATED CATALYST

Franco Codignola, Castenedolo; Giorgio Vergini, Milan; Paolo Gronchi, Milan, and Paolo Centola, Milan, all of Italy, assignors to Societa Italiana Serie Acetica Sintetica S.p.A., Milan, Italy

Filed Oct. 17, 1979, Ser. No. 85,792

Claims priority, application Italy, Jun. 15, 1979, 23655 A/79

Int. Cl.[3] C07C *33/046*

U.S. Cl. 568—855 3 Claims

1. A process for the preparation of 1,4-butynediol comprising reacting acetylene and formaldehyde at a temperature between 70° C. and 150° C. and at an acetylene pressure of between 0.5 and 1.5 atmospheres in the presence of a catalyst comprising an acetylide of copper supported on and chemically bonded to a molecular sieve material or a synthetic zeolite through an ion exchange reaction so that the copper atoms and the support form an inorganic, polymeric, crystal lattice in which the copper atoms are positioned at regularly distributed sites.

4,288,642

PRODUCTION OF ω-ALKENE-1-OLS

Tohr Yamanaka, Kamakura, and Takashi Imai, Hiratsuka, both of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1980, Ser. No. 114,529

Claims priority, application Japan, Jan. 23, 1979, 54-6696

Int. Cl.[3] C07C *29/60*

U.S. Cl. 568—903 4 Claims

1. A process for producing an ω-alkene-1-ol which comprises heating an α,ω-alkanediol having 4 to 14 carbon atoms together with a fatty acid selected from the group consisting of stearic acid, palmitic acid and a mixture thereof, the molar ratio of said fatty acid to said α,ω-alkanediol being about 1:0.8 to 1:3.0, at a temperature of about 310° to 360° C. in the absence of a catalyst, and continuously feeding the α,ω-alkanediol to the reaction system, with the pressure of the reaction system being controlled to 200 to 700 mmHg, while maintaining the same temperature and simultaneously distilling the ω-alkene-1-ol.

4,288,643

PROCESS FOR PREPARING 2,3-DIMETHYL-BUTENE-2

Jürgen Weber, Oberhausen; Wolfgang Bernhagen, Mulheim an der Ruhr, and Helmut Springer, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,830

Claims priority, application Fed. Rep. of Germany, May 3, 1979, 2917779

Int. Cl.[3] C07C *1/253*

U.S. Cl. 585—324 19 Claims

1. A process for preparing 2,3-dimethylbutene-2 comprising

treating isovaleraldehyde by methylenation to form α-isopropylacrolein,

treating α-isopropylacrolein by hydrogenation to form 2,3-dimethylbutanol,

treating 2,3-dimethylbutanol by dehydration to form an olefin mixture, said olefin mixture including 2,3-dimethylbutene-1 and 2,3-dimethylbutene-2, and

isomerizing the 2,3-dimethylbutene-1 of said olefin mixture to form 2,3-dimethylbutene-2.

4,288,644

PROCESS FOR ISOMERIZATION OF TETRAHYDRODIMETHYLDICYCLOPENTADIENE

Edward J. Janoski, Havertown; Abraham Schneider, Overbrook Hills, and Richard E. Ware, Aston, all of Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 961,911, Nov. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 838,182, Sep. 30, 1977, abandoned. This application Dec. 19, 1979, Ser. No. 105,169

Int. Cl.[3] C07C *13/61*

U.S. Cl. 585—360 10 Claims

1. Process for the catalytic isomerization of endo tetrahydrodimethyldicyclopentadiene comprising:

(a) contacting endo tetrahydrodimethyldicyclopentadiene with a catalytic amount of acidic alumina having isomeric activity;

(b) having the contacting occur at an isomerization temperature in the range of from about 100° C. to about 400° C. and in the presence of sufficient hydrogen to maintain the isomeric activity of the alumina; and

(c) continuing the contacting until the endo diene is isomerized to its exo isomer.

4,288,645

PROCESS FOR THE PREPARATION OF AROMATIC HYDROCARBONS AND HYDROGEN FROM PROPANE

Nigel Wagstaff, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 28, 1980, Ser. No. 125,734

Claims priority, application Netherlands, Mar. 14, 1979, 7902020

Int. Cl.³ C07C 2/76, 15/02

U.S. Cl. 585—415 5 Claims

1. A process for the preparation of aromatic hydrocarbons and hydrogen, which comprises contacting in a contact zone as feed propane or a hydrocarbon mixture which consists of more than 75%w C_4-paraffins and of at least 50%w propane and less than 20% methane and/or ethane at a temperature of from 400°–700° C., a space velocity of from 0.5 to 10 $g.g^{-1}.h^{-1}$ and a pressure of between 5 and 10 bar with a crystalline silicate containing 0.05 to 20% w zinc as the promoter as the catalyst, which silicate is characterized in having the following properties after 1 hour's calcining in air at 500° C.:

(a) thermally stable up to a temperature above 600° C.,

(b) an X-ray powder diffraction pattern showing, inter alia, the reflections given in Table A.

TABLE A

Radiation: Cu-K 2 θ	Wavelength 0.15418 nm relative intensity
7.8–8.2	S
8.7–9.1	M
11.8–12.1	W
12.4–12.7	W
14.6–14.9	W
15.4–15.7	W
15.8–16.1	W
17.6–17.9	W
19.2–19.5	W
20.2–20.6	W
20.7–21.1	W
23.1–23.4	VS
23.8–24.1	VS
24.2–24.8	S
29.7–30.1	M

(c) after conversion of the silicate into the H-form and after evacuation at 2×10^{-9} bar and 400° C. for 16 hours and measured at a hydrocarbon pressure of 8×10^{-2} bar and 100° C., the adsorption of n-hexane is at least 0.8 mmol/g, the adsorption of 2,2-dimethylbutanes at least 0.5 mmol/g and the ratio

$$\frac{\text{adsorption of n-hexane}}{\text{adsorption of 2,2-dimethylbutane}}$$

at least 1.5,

(d) the composition, expressed in moles of the oxides, is as follows:

$$y.(1.0\pm0.3)\ M_{n/2}O.y.\ Al_2O_3.SiO_2,$$

wherein M=H and/or alkali metal and/or alkaline-earth metal, n is the valency of M and y=0.0065 to 0.1; and recovering an aromatic hydrocarbon mixture and hydrogen-containing gas from said contact zone.

4,288,646

REGIOSELECTIVE PREPARATION OF β-ISOPROPYLNAPHTHALENE OVER SUPERACIDIC SOLID OR SUPPORTED PERFLUORINATED SULFONIC ACID CATALYSTS

George A. Olah, Beverly Hills, Calif., assignor to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Oct. 5, 1979, Ser. No. 82,164

Int. Cl.³ C07C 2/66

U.S. Cl. 585—458 8 Claims

1. A process for the regionselective production of β-isopropylnaphthalene which comprises reacting naphthalene with a propylating agent over a superacidic solid or supported solid perfluorinated sulfonic acid catalyst.

4,288,647

SHAPE SELECTIVE REACTIONS WITH ALKALINE EARTH-MODIFIED ZEOLITE CATALYSTS

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 10, 1980, Ser. No. 128,688

Int. Cl.³ C07C 2/68, 5/22, 5/52, 15/12

U.S. Cl. 585—467 26 Claims

1. A process for conversion of organic compounds, said process comprising contacting said organic compounds with a crystalline zeolite catalyst at a termperature of between about 250° C. and about 750° C. and a pressure within the approximate range of 10^5 N/m^2 to 10^7 N/m^2, said zeolite being characterized by a silica to alumina mole ratio of at least 12 and a constraint index within the approximate range of 1 to 12, said zeolite having undergone prior modification by treatment with compounds containing one or more of the elements comprising the alkaline-earth metals, to deposit thereon at least 0.25 weight percent of such element.

15. The process of claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 or 14 wherein said conversion comprises the alkylation of an aromatic compound by contacting said compound with an alkylating agent to produce dialkylbenzene compounds wherein the 1,4-dialkylbenzene isomer is present in excess of its normal equilibrium concentration.

19. The process of claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 or 14 wherein said conversion comprises the transalkylation of aromatic compounds to produce dialkylbenzene compounds wherein the 1,4-dialkylbenzene isomer is present in excess of its normal equilibrium concentration.

4,288,648

PROCESS FOR THE OLIGOMERIZATION OF ETHYLENE

David L. Beach, and Thaddeus P. Kobylinski, both of Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 21, 1980, Ser. No. 151,961

Int. Cl.³ C07C 2/02, 2/26

U.S. Cl. 585—523 67 Claims

1. A process for oligomerizing ethylene which comprises contacting ethylene with a catalyst composition obtained by contacting (a) a refractory metal oxide/silica support wherein the silica content of said support is from about 2 to about 95 weight percent and the metal oxide content of said support is from about 5 to about 98 weight percent with (b) a tris(cyclopentadienyl)trinickel dicarbonyl.

4,288,649

ISOBUTYLENE POLYMERIZATION PROCESS

David A. McCaulay, Homewood, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 69,097, Aug. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 941,086, Sep. 11, 1978, abandoned. This application May 30, 1980, Ser. No. 154,943

Int. Cl.³ C07C 2/02

U.S. Cl. 585—533 16 Claims

1. A process for producing viscous polyisobutylene having a number average molecular weight greater than about 1,250 which comprises contacting a normally gaseous olefin stream feed comprising isobutylene with a halided alumina at a temperature of about −25° to 52° C. at sufficient pressure to maintain the feed in a liquid phase.

4,288,650

ELECTRICAL INSULATION DEVICE

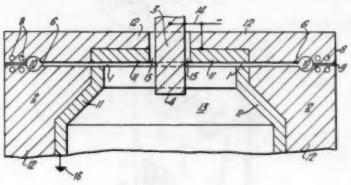
Michael Robinson, Wooton, England, assignor to LaPorte Industries Limited, London, England

Filed Mar. 20, 1979, Ser. No. 22,319

Claims priority, application United Kingdom, Mar. 23, 1978, 11612/78

Int. Cl.³ H05H *1/26*

U.S. Cl. 13—2 P **27 Claims**



1. A structure requiring electrical insulation between two parts thereof, a surface of the structure being intended for exposure in use in a furnace to radiation from a heat source having a temperature sufficiently elevated to cause a reduction in the electrically insulating properties of normally insulating constructional materials, characterised by the provision of a slot in the structure between the two parts thereof the slot extending from the heat exposed surface of the structure into the depth of the structure the slot being positioned and dimensioned so that the base of the slot would not view the heat source in use.

4,288,651

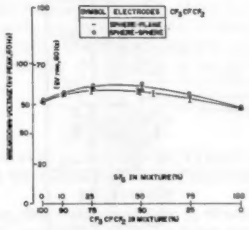
DIELECTRIC GAS SELECTED FROM BINARY MIXTURES OF SF_6, SO_2 AND CF_3CFCF_2

Roy E. Wootton, Murrysville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 6, 1979, Ser. No. 100,839

Int. Cl.³ H01B *3/56*

U.S. Cl. 174—17 GF **8 Claims**



1. A dielectric gas mixture comprising a binary pair of gases selected from the group consisting of (a) SF_6 and CF_3CFCF_2, (b) SO_2 and CF_3CFCF_2, and (c) SO_2 and SF_6.

4,288,652

CORRUGATED OUTER SHEATH GAS-INSULATED TRANSMISSION LINE

George A. Kemeny, Pittsburgh, and Alan H. Cookson, Churchill Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 16, 1979, Ser. No. 21,391

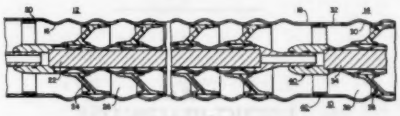
Int. Cl.³ H01R *4/02*

U.S. Cl. 174—21 C **5 Claims**

1. A high-voltage gas-insulated transmission line comprising:

first and second transmission line sections each comprising an elongated, corrugated tubular outer housing having a smooth end section, an elongated electrical conductor disposed within said outer housing, means for insulatably supporting said conductor within said outer housing, and an insulating gas electrically insulating said conductor from said outer housing, said electrical conductors being electrically connected to each other; and

joining means for sealingly fixedly joining said outer housings to each other at said smooth end sections thereof; said joining means comprising:



a first annular housing extension fixedly secured to one of said smooth end sections and extending longitudinally outwardly therefrom;

a second annular housing extension fixedly secured to the other of the smooth end sections and extending longitudinally outwardly therefrom, said first and second annular housing extensions being disposed adjacent to each other; and

a weld bead disposed between, contacting and joining said first and second annular housing extensions.

4,288,653

DISTRICT-HEATING LINE AND A METHOD OF MANUFACTURING THE SAME

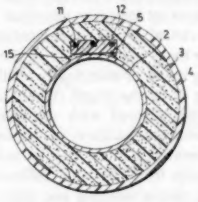
Hans Blom, Box 3158, S-103 63 Stockholm, and Leif Wiberg, 15 Observatoriegatan, S-113 25 Stockholm, both of Sweden

Filed Mar. 17, 1980, Ser. No. 130,725

Claims priority, application Sweden, Jun. 18, 1979, 7905331

Int. Cl.³ F17D *5/06*; F16L *55/00*

U.S. Cl. 174—47 **4 Claims**



1. A district heating line of the kind including an inner metal tube for transporting a heat transfer medium, an insulating layer of foam-plastic material arranged around the metal tube, a moisture impenetrable protective tube surrounding said foam-plastic layer, at least one electrical conductor formed as part of an electrical circuit, elongated blocks mounted on and affixed to the inner metal tube along the length of the tube, said blocks being made of electrically insulating material and having extending along the length thereof at least one radially outwardly opening channel with the channels on adjacent blocks aligned with one another, said channels being dimensioned to accommodate said electrical conductor and position it at a fixed distance from the outer cylindrical surface of the inner metal tube, and means securing said electrical conductor in said channels at said fixed distance from the outer cylindrical surface of the inner metal tube.

4. A method of manufacturing a district heating line including the steps of forming elongated blocks each having at least one axially extending radially outwardly opening channel dimensioned to receive at least one electrical conductor, attaching a plurality of said elongated blocks to the outer surface of a metal tube with the channels of adjacent blocks in alignment, positioning at least one electrical conductor in the

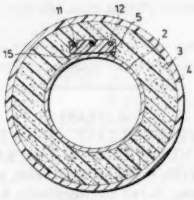
aligned channels and securing said conductor at a fixed distance from said elongated metal tube, arranging a protective tube around and coaxial with the metal tube and elongated blocks, and pouring a hardenable foamable plastic material in the annular chamber between the metal tube and the protective tube.

4,288,654

DISTRICT-HEATING LINE

Hans Blom, Box 3158, S-103 63 Stockholm, and Leif Wiberg, 15 Observatoriegatan, S-113 25 Stockholm, both of Sweden

Filed Mar. 17, 1980, Ser. No. 131,142
Claims priority, application Sweden, Sep. 5, 1979, 7907400
Int. Cl.³ F17D *5/06*; F16L *55/00*
U.S. Cl. 174—47 **1 Claim**



1. A district heating line of the kind including an inner metal tube for transporting a heat transfer medium, an insulating layer of foamed-plastic material arranged around the metal tube, a moisture impenetrable protective tube surrounding said foamed-plastic layer, at least one electrical conductor formed as part of an electrical circuit, elongated blocks mounted on and affixed to the inner metal tube along the length of the tube, said blocks being made of electrically insulating material and having extending along the length thereof at least one radially outwardly opening channel with the channels on adjacent blocks aligned with one another, said channels being dimensioned to accommodate said electrical conductor and position it at a fixed distance from the outer cylindrical surface of the inner metal tube, means securing said electrical conductor in said channels at said fixed distance from the outer cylindrical surface of the inner metal tube, and a water soluble salt incorporated in said electrically insulating blocks.

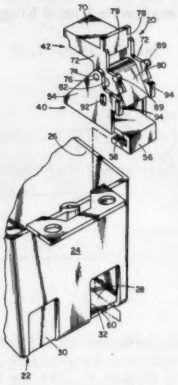
4,288,655

CABLE LOCK ASSEMBLY FOR OUTLET BOX

John L. Lass, Homewood, Ill., assignor to Square D Company, Palatine, Ill.

Filed Oct. 4, 1979, Ser. No. 81,944
Int. Cl.³ H02G *3/08*
U.S. Cl. 174—65 R **19 Claims**

1. In an electrical outlet box having at least one knock-out hole in one wall, a cable lock assembly including a first member having a locking lip defining a recess receiving a free edge of said knock-out hole to secure said assembly to said outlet box, said first member having a first cable engaging surface generally aligned with said hole and having a pair of legs extending away from said surface, a second member pivotally supported on said legs of said first member, said second member having a portion engaging said one wall adjacent said knock-out hole in said closed position to substantially enclose said hole and lock said assembly in said outlet



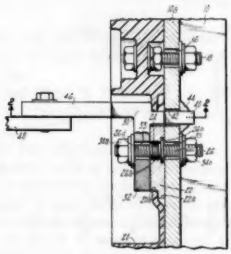
box, said second member having a second cable engaging surface pivotal toward said first cable engaging surface to grip a cable therebetween.

4,288,656

BOLTED/WELDED JOINT FOR SWITCHBOARD RUN-IN CONNECTOR

William F. Olashaw, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 19, 1980, Ser. No. 150,859
Int. Cl.³ H02B *1/20*; H02G *5/00*; H01R *4/02*
U.S. Cl. 174—71 B **4 Claims**



1. In an electrical switchboard, a bolted/welded electrical joint for electrically connecting an aluminum riser bus with an electrical device installed in a switchboard cubicle; said joint comprising, in combination:

A. an L-shaped run-in connector fabricated of aluminum having a horizontal segment extending forwardly to a termination facilitating electrical connection with a terminal of the device and a vertical segment;

B. a rearwardly extending projection formed with said vertical segment;

C. means forming an opening in the riser bus;

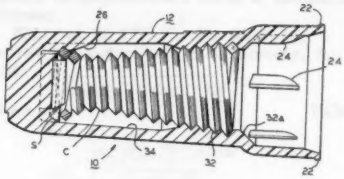
D. a bolt clamping said vertical segment in electrical connection with the riser bus with said projection protruding through said opening in the riser bus; and

E. a weld electrically joining said projection to the riser bus along the edge of said opening therein.

4,288,657
FREE-SPRING WIRE CONNECTOR

Arthur F. Swanson, DeKalb, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,511
Int. Cl.³ H01R *4/22*
U.S. Cl. 174—87 **7 Claims**



1. A twist-on connector for connecting the stripped ends of a bundle of insulated wires comprising, in combination:

a hollow generally tubular shell of plastic material having an opening at one end thereof and a closed end wall at the other end thereof which is generally perpendicular to the longitudinal axis of said shell;

a plurality of circumferentially spaced and longitudinally extending ribs on the inner surface of said shell and extending from points adjacent said opening toward the central portion of said shell;

a coiled spring wound from a wire having a generally polygonal cross-sectional area which provides an edge on at least the external surface of said coiled spring, and said coil spring being inserted into said shell by threading said coil spring into said shell;

a stop member positioned along a peripheral portion of said end wall for engaging the free inner end of said coil spring for transfering external torsional forces applied to said shell to the other end of said coil spring; and,

the inner side of said end wall having a stepped transition portion between areas of differing longitudinal dimensions which provide a differential torque distribution to the wire bundle ends projecting through the open inner end of said coil spring, thereby to alter the initial alignment of the wire ends relative to the bundle diameter and into a diameter which exceeds the diameter of the inner end of said coil spring.

4,288,658
APPARATUS FOR GENERATING TELEX SIGNALING SEQUENCES IN A DISTRIBUTED PROCESSING TELEX EXCHANGE

Larry C. Bieber, Simi Valley, and Jack L. Woodell, La Canada, both of Calif., assignors to Frederick Electronics Corporation, Frederick, Md.

Filed Nov. 6, 1979, Ser. No. 91,793
Int. Cl.³ H04L *11/00*; H04Q *3/54*; G06F *11/00*
U.S. Cl. 178—3 **30 Claims**

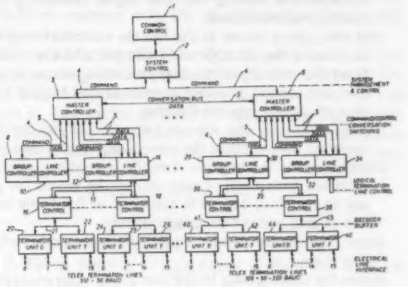
19. A device for the high-speed time share processing of the input and output signals in a plurality of data channels to achieve the real time processing of each channel, the device comprising:

(a) a supervising processor, for supervising the handling of the signals for each data channel;

(b) a sequence file responsive to said supervising processor, for controlling the sequence in which the data channels are time share processed during time share intervals, one data channel processed in each time share interval;

(c) input and output microprocessors responsive to said sequence file and said supervising processor, for executing signaling routines selected by said supervising processor which simultaneously process the respective input and output signals for the same data channel during each time share interval, said input and output microprocessors generating interprocessor flags to coordinate the execution of their respective signaling routines; and

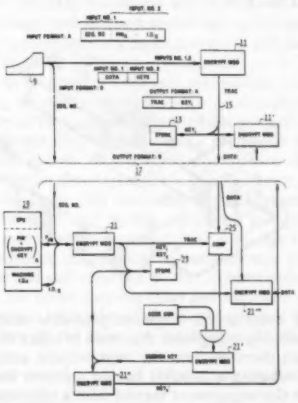
(d) an input-output interface connected between said microprocessors and the data channels, for translating between the signaling levels of said microprocessors and the signaling of the data channels, and for selecting the data channel currently being time share processed to input to or receive signals from said processors, said supervising processor and said input and output microprocessors cooperating together to achieve the real time processing of the signals for each data channel.



4,288,659
METHOD AND MEANS FOR SECURING THE DISTRIBUTION OF ENCODING KEYS

Martin M. Atalla, Menlo Park, Calif., assignor to Atalla Technovations, Sunnyvale, Calif.

Filed May 21, 1979, Ser. No. 40,687
Int. Cl.³ H04L *9/00*
U.S. Cl. 178—22.08 **6 Claims**



1. Data-handling apparatus for securing the transmission of data under control of an authorized individual from one location having an identification number to data processing means having memory means with the identification number stored therein at a remote location, the apparatus comprising:

encrypting means at the one location and remote location, each for producing first and second encoded outputs as a logical combination of a pair of signals applied thereto;

input means at the one location coupled to the encrypting means for applying a pair of signals thereto which are representative of the identification number for the one

location and of a code signal associated with the authorized individual;

at the one location, storage means for storing the first encoded output produced by the encrypting means;

at the remote location, data processing means having memory and storing the identification number for the one location and storing the code signal associated with the authorized individual;

said encrypting means at the remote location being coupled to receive the identification number and the code signal from the memory of the data processing means to produce first and second encoded outputs as said logical combination of signals applied thereto;

storage means at the remote location for storing the first encoded output from the encrypting means thereat;

comparator means responsive to the second encoded outputs received from each of said encrypting means for producing an enabling output in response to favorable comparison of said second encoded outputs;

means responsive to said enabling output for producing a key code;

means for transmitting to the one location an encrypted key code as the second logical combination of said key code and the first encoded output from the storage means at said remote location;

means at said one location for decrypting the encrypted key code received thereat with respect to the first encoded output stored thereat and the second logical combination to produce the key code; and

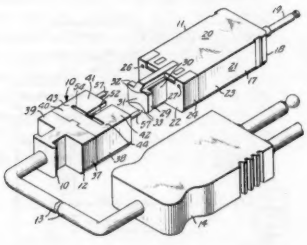
means at said one location and said remote location for encoding and decoding data thereat with respect to the same logical manipulation of an applied signal and said encoding key.

4,288,660

TEST CORD FOR TELEPHONE CIRCUITS

Michael Fasano, Syosset, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,921
Int. Cl.³ H04M *1/00, 3/22, 1/24*
U.S. Cl. 179—1 PC **4 Claims**



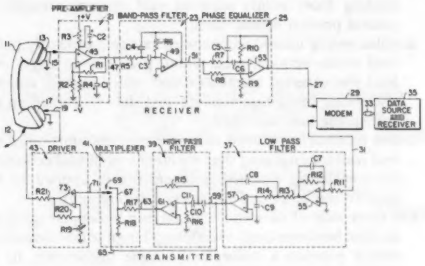
1. In a combination telephone protector module and test plug detachably engageable therewith to effect electrical communication therebetween, the improvement comprising: said module including a housing having an inner end providing means for the engagement thereof with a telephone connector block, and an outer end surface having openings therein providing access to electrically conductive terminals communicating with said inner end, a handle member mounted generally centrally on said outer end surface, said handle member having an enlargement thereon; said test plug having a cross sectional configuration generally corresponding to that of said housing of said module, and defining a recess extending outwardly from an inner end surface thereof sufficient to clear said handle upon engagement of said plug with said housing, and axially aligning said plug and said housing; a plurality of resiliently extendable pins on said plug projecting from said inner end surface thereof, and of effective cross sectional diameter substantially smaller than that of said openings in said outer end surface of said housing, said pins penetrating said openings upon engagement of said plug with said module, and effecting communication with said electrically conductive terminals without substantial contact with said openings; said handle and said plug having cooperative resilient detent means for maintaining said plug and housing in selectively engaged condition.

4,288,661

INTERFACE CIRCUITRY FOR ACOUSTIC COUPLER COMPENSATION

Baldev Krishan, San Jose, Calif., assignor to Anderson Jacobson, Inc., San Jose, Calif.

Filed Feb. 21, 1979, Ser. No. 13,021
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 C **7 Claims**



1. For an acoustic coupler that comprises,

a microphone adapted to receive from a telephone handset receiver an acoustic signal in a band between first and second distinct frequencies and to apply the received signal in an electronic form to a modem, and

a speaker adapted to acoustically transmit to a telephone handset transmitter a signal received in an electronic form from a modem in a band between third and fourth distinct frequencies,

an electronic interface circuit adapted to be connected between the modem and the coupler microphone and speaker for compensation of unequal amplitude acoustic coupling between a telephone handset and the coupler microphone and speaker of the various distinct frequency signals, said interface circuits comprising,

first means receiving electrical signals from said microphone before applying them to the modem for compensating for any unequal amplitude transmittance between said handset receiver and said coupler microphone of acoustic tone signals within said first and second distinct frequency band, said first means including a filter that attenuates one of said first and second frequency bands more than the other and means for equalizing any phase distortion introduced by said filter, and

second means adapted to receiving electrical signals from said modem and apply them to the coupler speaker for compensating for any unequal amplitude transmittance between said coupler speaker and said handset receiver of acoustic tone signals within said third and fourth distinct frequency band.

4,288,662

CIRCUIT ARRANGEMENT FOR TELEPHONE EXCHANGE SYSTEMS, ESPECIALLY SUBSCRIBER EXTENSION STATION INSTALLATIONS, WITH ADDITIONAL DATA TRAFFIC, FOR EXAMPLE WITH TELEPRINTER EQUIPMENT

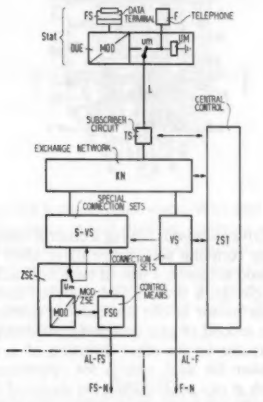
Franz Fahrenschon, Neuried; Alfred Meier, Munich, and Hans Thinschmidt, Germering, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 68,081

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1978, 2837654

Int. Cl.³ H04M *11/06*

U.S. Cl. 179—3 **7 Claims**



1. A switching arrangement for telephone exchange systems in which a telephone subscriber station includes telephone and data devices, a telephone exchange installation includes an exchange network having a telephone exchange line leading to the subscriber station, and a separate data exchange system has a separate data exchange line for connection with a selected data exchange subscriber, said switching arrangement comprising:

(a) special connection means (S-VS) selectable via the exchange network in response to a preassigned special selection signal transmitted to the exchange installation via the telephone exchange line;

(b) a special facility (ZSE) connected directly with a separate data exchange line (AL-FS) of the separate data exchange system (FS-N);

(c) said special facility (ZSE) having switching devices (FSG, MOD-ZSE) for receiving and converting line signals and data information destined for said separate data exchange system (FS-N); for receiving and converting line signals and data information from the separate data exchange system (FS-N); and operable in a data traffic mode for transmitting data information received from the data device of the telephone subscriber station, as converted, to said separate data exchange line; and for transmitting data information received from said separate data exchange line, as converted, to the data device of the telephone subscriber station;

(d) changeover means in said special facility (ZSE) responsive to line signals received as a result of a connection request from one of said telephone subscriber station and said separate data exchange system for switching said special facility (ZSE) from telephone traffic mode to said data traffic mode; said changeover means in said data traffic mode providing for said transmission of data information from the data device of the telephone subscriber station along a data transmission path which extends via the telephone exchange line (L), the exchange network, and the special connection means (S-VS) to said special facility (ZSE), and providing for said transmission of data information to the data device of the telephone subscriber station also via said data transmission path;

(e) said special facility (ZSE) being operable to transmit selection signals via the separate data exchange line (AL-FS) for controlling the separate data exchange system (FS-N) to connect with the desired data exchange subscriber; and

(f) said special facility (ZSE) being responsive to connection requests which arrive via the separate data exchange line (AL-FS) to process the selection digits received via said separate data exchange line (AL-FS) sufficiently to identify the desired telephone subscriber station (Stat) before release of any supervisory signal to said separate data exchange line (AL-FS).

4,288,663

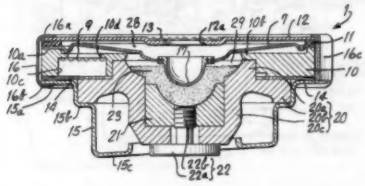
NOISE CANCELING TRANSMITTER

James P. Foley, Astoria, N.Y., assignor to Roanwell Corporation, New York, N.Y.

Filed Mar. 5, 1980, Ser. No. 127,324

Int. Cl.³ H04M *1/19;* **H04R** *21/02*

U.S. Cl. 179—122 **6 Claims**



1. A noise canceling transmitter comprising:

a. a circular diaphragm (**7**) of electrically conductive material;

b. a circular grid (**12**) insulatingly spaced from one surface of the diaphragm and having a central aperture (**12***a*)through which sound waves may impinge on said one surface;

c. means (**10,20,21**) defining a chamber (**29**) on the opposite side of the diaphragm from said one surface, said means including an annular member (**10**) of electrically conductive material having a radially inwardly projecting flange (**10***b*) adjacent said chamber and a peripheral rim (**10***a*) supporting the rim only of said opposite side of the diaphragm so that the diaphragm is free to vibrate;

d. an annular frame (**16**) encircling the diaphragm and the annular member and having peripheral apertures (**16***d*) therein, said annular member having a passage (**10***c*) providing acoustic communication between said peripheral apertures and said chamber, so that ambient noise passing through the cover aperture (**12***a*) and the frame apertures (**16***d*) reaches both sides of the diaphragm and the vibratory effects of the noise on the diaphragm substantially cancel;

e. an internal movable contact (**17**) fixed on the center of the diaphragm;

f. an internal stationary contact (**21**) in said chamber opposite said movable contact;

g. a mass (**23**) of granular carbon enclosed in the chamber (**29**) between the internal contacts and subject to varying compression as the diaphragm vibrates;

h. an external annular contact (**15**) electrically connected (**14,10,7**) to the internal movable contact;

i. an external central contact (**22***a*) within and spaced from the annular contact (**15**) and electrically connected to the internal stationary contact;

wherein the improvement comprises:

j. an annular insulator (**20**) in said means including an inter-

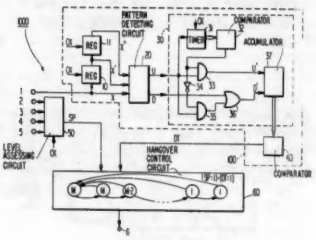
nal flange (20*a*) projecting axially toward the diaphragm and engaging the flange on the annular member, a peripheral flange (20*b*) adjacent said annular member, and a cup (20*c*) extending axially in the opposite direction from the internal flange and receiving said stationary contact, said cup being open toward said chamber and receiving the internal stationary contact, the end of the cup remote from the chamber having a central opening for receiving the external central contact.

4,288,664

NEUTRALIZATION SIGNAL DEVELOPING DEVICE FOR AN ECHO SUPPRESSOR

Takashi Araseki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1979, Ser. No. 52,151
Claims priority, application Japan, Jun. 30, 1978, 53-80121
Int. Cl.³ H04Q *1/46;* H04B *3/20*
U.S. Cl. 179—170.2 **6 Claims**



1. A neutralization signal developing device for an echo suppressor, which is required for the transmission of data over a telephone line having four-wire circuits, each transmission of data being preceded by an identification signal at a given frequency, an input analog signal including said identification signal being sampled and quantized so that each sampled value is encoded into a binary codeword composed of a sign bit and a preset number of bits representing the magnitude of said analog signal, said device comprising:

means for receiving the series of codewords;

means responsive to a portion of each codeword in said series of codewords for detecting said identification signal;

means responsive to another portion of each codeword in said series of codewords for assessing the level of said series of codewords; and

means responsive to the outputs of said detecting means and said level assessing means for developing a neutralization signal for the echo suppressor, wherein said detecting means includes means for successively producing bit patterns from sign bits of said series of codewords;

means responsive to said bit patterns for producing a first detection signal if one of said bit patterns coincide with a first predetermined bit pattern and producing a second detection signal if one of said bit patterns coincides with a second predetermined bit pattern;

counting means responsive to said first and second detection signals for increasing its contents by a first predetermined number if said first detection signal is generated at any one of predetermined recurrence cycles and decreasing its contents by a second predetermined number if said second detection signal is generated; and

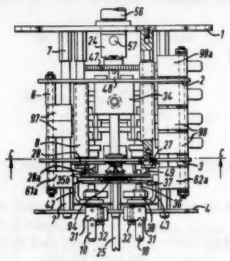
means responsive to the output of said counting means for producing an output signal indicating the presence of said identification signal if the output of said counting means exceeds a predetermined value.

4,288,665

ELECTRIC SWITCH CONTROL UNIT, MORE PARTICULARLY FOR ELECTRIC MOTOR DRIVEN ACTUATORS

Frederick A. Smith, Bristol, England, assignor to Rotork Limited, Bath, England

Filed Apr. 2, 1979, Ser. No. 26,308
Claims priority, application United Kingdom, Apr. 4, 1978, 13152/78
Int. Cl.³ H01H *3/00*
U.S. Cl. 200—18 **11 Claims**



1. A motor driven actuator having a control unit comprising: a motor; means coupling said motor drive shaft to an input drive shaft of said actuator; a pair of switches each connected in an electric circuit, a first of said switches controlling the operation of the motor in one direction of movement of the actuator, and a second of said switches controlling the operation of the actuator in the other direction of movement, an actuating member for each switch for operating the corresponding switch at any point during the stroke of the actuator in accordance with the output force or the output movement of the actuator, a latch member associated with said switch actuating members, said latch member being drivably connected with the input drive shaft of said control unit for movement relative to one of said switch actuating members depending on the direction of movement of the actuator, a pair of pins for normally preventing movement in a first direction, said pins being mounted one on each of said switch actuating members and being each positioned in a first location during normal operation of said actuator prior to actuation of said switches; said pair of pins being movable with its switch actuating member upon movement of the actuating member to its switch operating position from said first location to a second location in which said latch member is movable into a position in which the latch member locks the actuating member in its switch operated position, said latch member operating to prevent the release of said switch actuating member whereby a corresponding switch is reset until the actuator input drive shaft moves in the reverse direction of said first direction.

4,288,666

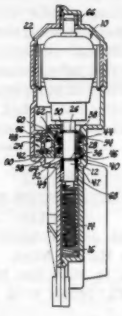
REACTION SWITCH FOR AN ACTUATOR DRIVE SYSTEM

Carlton A. Milbrandt, Dayton, and Roy C. Schoen, West Milton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1979, Ser. No. 92,198
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—47 **2 Claims**

1. An improvement in reaction switches for use with a worm gear drive wherein a worm shaft, rotatably driven by an electric motor, meshes with a worm gear subject to reaction load and at a predetermined reaction force level is moved longitudinally, the improvement comprising; a pair of electrical switch actuating members operatively associated with said worm shaft; primary spring means disposed between and urging said switch actuating members in opposite directions; stop means

for positioning said actuating members, a pair of longitudinal force transmitting means secured to said worm shaft and selectively connectable with respective actuating members to selectively and individually move said actuating members longitudinally from their respective stop positions when the longitudinal force in the worm shaft is greater than the force in said primary spring member; and secondary spring means operatively connected between said worm shaft and a member stationary with respect to said shaft for applying a unidirectional force thereto so that a predetermined reaction load is required before the worm shaft will move longitudinally in one direction and a reaction load greater than the predetermined reaction load is required before the worm shaft will move longitudinally in the other direction.



4,288,667

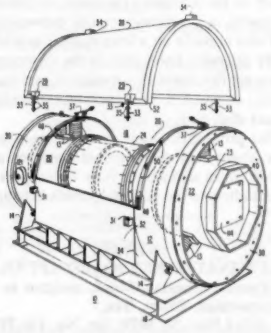
TELESCOPING DISCONNECT SWITCH WITH RAIL-MOUNTED TELESCOPE SECTION

Jayant M. Patel, Cincinnati, Ohio; Jerome K. Wolfe, Murrysville, Pa.; Forrest E. Coyle, Penn Hills, Pa., and James R. Farley, Plum Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 956,817, Nov. 1, 1978, abandoned. This application Apr. 15, 1980, Ser. No. 140,515

Int. Cl.³ H01H *31/32*

U.S. Cl. 200—48 R **2 Claims**



1. A telescoping high current disconnect switch for isolated phase bus comprising:

a cylindrical conductive housing;

a stationary contact disposed within said housing;

a movable contact axially movable within said housing and cooperating with said stationary contact to open and close an electrical circuit;

support means comprising a rail parallel to said housing; and

a bearing member fixedly attached to said movable contact, said bearing member comprising ball bearings movably bearing directly upon said rail,

said rail and said bearing member being positioned within the magnetic field produced by current flow through said switch and said rail consisting essentially of non-ferromagnetic work-hardenable material;

movement of said movable contact causing movement of said ball bearings along said rail, whereby said ball bearings cold-form grooves in said rail to work-harden selected portions thereof.

4,288,668

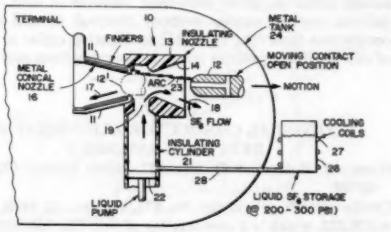
CIRCUIT INTERRUPTER USING A MINIMUM OF DIELECTRIC LIQUID

William H. Fischer, Pittsburgh; Charles F. Cromer, Trafford, and Joseph R. Rostron, Murrysville, all of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 826,382, Aug. 22, 1977. This application Feb. 13, 1980, Ser. No. 121,165

Int. Cl.³ H01H *33/75*

U.S. Cl. 200—150 G **7 Claims**



1. A circuit interrupter using a minimum of dielectric liquid having a low critical temperature at which it becomes gaseous relative to ambient temperature comprising: fixed contact means; an electrical and thermal insulating nozzle having a nozzle throat and an aperture in the side wall of said nozzle; a movable contact normally inserted in said nozzle throat and into electrical contact with said fixed contact means, said movable contact normally closing said aperture; an insulated cylinder for containing a predetermined quantity of said liquid having one end connected to said aperture in said side wall of said nozzle and the other end to a pump piston; liquid storage means having a pressure above ambient pressure permanently connected to said cylinder by a pipeline for filling said cylinder with said liquid at a relatively slow rate including cooling means for said storage means for maintaining said liquid in said storage means, in said pipeline, and in said insulating cylinder below said critical temperature in its liquid phase; said moving contact which normally closes said aperture when withdrawn allowing said predetermined quantity of liquid to flow, in response to actuation of said pump piston, through said nozzle throat at a relatively high rate to extinguish any arc created by said withdrawal of said contact.

4,288,669

ELECTRIC CONTROL DEVICE

Kurt A. Grunert; William J. McKean, and John E. Grad, all of Beaver, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

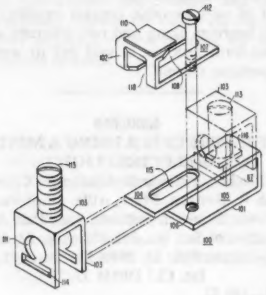
Filed Nov. 19, 1979, Ser. No. 95,802

Int. Cl.³ H01H *9/00*

U.S. Cl. 200—281 **4 Claims**

1. An electric control device, comprising a housing, a control device structure supported on the housing, said control device structure comprising a contact combination, said contact combination comprising a separable pull-out terminal assembly having at one end a separable pull-out contact carrier

with a stationary contact mounted thereon, a separable terminating collar with a convolute opening for securing electrical conductors mounted at its other end, and said separable pull-out terminal assembly cooperating with said separable terminating collar to allow individual removal of said separable pull-out contact carrier without removal of said electrical conductors from said separable terminating collar or removal of said separable pull-out terminal assembly from said housing.



4,288,670

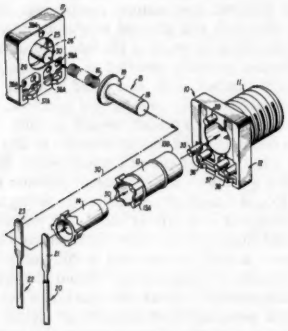
ELECTRICAL CONDUCTOR ALIGNMENT AND RETAINING ASSEMBLY

Horace J. Buttner, P.O. Box 487, North Harbor City, Calif. 90710

Continuation-in-part of Ser. No. 873,030, Jan. 22, 1978, Pat. No. 4,175,222, which is a continuation of Ser. No. 720,319, Sep. 3, 1976, abandoned. This application Nov. 19, 1979, Ser. No. 95,707

Int. Cl.³ H01H *13/04*

U.S. Cl. 200—303 **11 Claims**



1. An assembly for maintaining proper positioning of a planar electrical terminal within a surrounding housing assembly of an electrically operated device, and comprising:

said housing assembly including first and second housing portions arranged in adjacently disposed relationship to one another;

said electrical terminal extending in a substantially single plane within said housing assembly and including a first portion forming an electrical attachment with an electrical conductor, with said terminal first portion extending beyond said housing;

pin means including a plurality of pin members each attached to one of said housing portions and extending into corresponding recess means formed in the remaining housing portion;

said pin means including at least one pair of spaced pin members arranged on opposite sides of said electrical conductor and in contact therewith, defining a distance between said pin members which is appreciably less than a width of a second portion of said planar electrical terminal positioned on an opposite side of said pair of pin members from said first portion of the terminal which extends beyond said housing, thereby preventing withdrawal of said planar electrical terminal between said pair of spaced pin members;

one of said housing portions further including retaining means for preventing angular movement of said second portion of said planar electrical terminal in a plane extending transversely through said spaced pin members; and

said housing portions including means for restricting motion of said second portion of said planar electrical terminal in a direction perpendicular to said transversely extending plane through said spaced pin members.

4,288,671

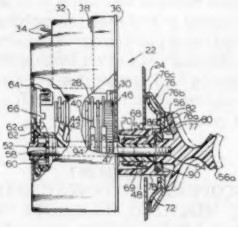
AUTOMATIC WASHER TIMER DIAL PROTECTIVE SHIELD

Russell J. Morrison, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 14, 1980, Ser. No. 111,715

Int. Cl.³ H01H *9/16, 19/00*

U.S. Cl. 200—304 **7 Claims**



1. In an automatic washer having a timer including a manually and automatically driven cam set for operating said washer through a sequence of washing operations and mounted within a console, a timer positioning and indicating mechanism comprising:

an indicator dial and integral dial support member affixed to said cam set for indicating its rotational position relative to said console, said indicator spaced outwardly from a front face of said console on a longitudinal axis of said cam set;

a manually operable knob selectively interconnectable with said cam set for one-way rotation of said cam set and said dial when connected, said knob spaced axially outwardly from said dial; and

a timer dial protective shield mounted in a freely rotatable manner about said dial support member and extending outwardly from said axis to fully encompass said dial, said position indicated by said dial visible through said shield.

4,288,672

ILLUMINATED KEYBOARD APPARATUS

Richard E. Puccini, Taunton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

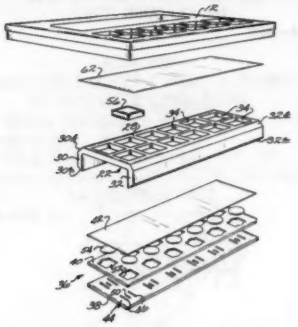
Filed Dec. 26, 1979, Ser. No. 106,777

Int. Cl.³ H01H *9/18*

U.S. Cl. 200—314 **13 Claims**

1. Keyboard apparatus comprising an escutcheon adapted to be mounted in a panel of a vehicle and having a surface with a plurality of key apertures therein, a thin flexible sheet underlying the escutcheon surface, the sheet having portions which are opaque and indicia portions which transmit light, a frame underlying the escutcheon surface and the flexible sheet, the frame being composed of light transmitting material, the frame having a top wall with a plurality of key member receiving

apertures extending therethrough, key members composed of light transmitting material slidably received in respective key member receiving apertures, the key members each having a protrusion extending from a bottom surface thereof, light interrupting means formed on the remainder of the key member bottom surface, a circuit board disposed beneath the top wall of the frame, the circuit board having a plurality of switches mounted thereon, a switch being aligned with each aperture in the top wall of the frame so that depression of a key member by a force acting through the flexible sheet will cause actuation of a switch, the frame having light transmitting legs having first and second end portions, the legs depending downwardly from the second end portions and extending beyond the circuit board and terminating at the first end portions, a light source disposed beneath the circuit board, first light reflector surfaces located at the first end portions of the legs and arranged to reflect light from the light source up the legs to the second end portions, and second light reflector surfaces located at the second end portions of the legs and arranged to reflect light received from the first reflector surfaces laterally toward key member apertures and their respective key members whereby light transmitted from one of the second reflector surfaces will be reflected upwardly by the light interrupting surface on the bottom of a key member and through the transparent indicia portion of the flexible sheet.



4,288,673

HIGH FREQUENCY INDUCTION HEATING APPARATUS

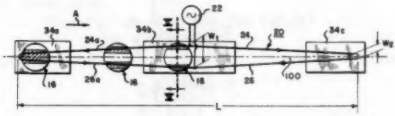
Kazuhisa Ishibashi, Tokyo, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jun. 11, 1979, Ser. No. 47,646

Claims priority, application Japan, Jul. 12, 1978, 53-84920; Jul. 12, 1978, 53-84921

Int. Cl.³ H05B 6/40

U.S. Cl. 219—10.69 **4 Claims**



1. In a high frequency induction heating apparatus having a heating station, a transport means for moving a non-magnetic metal article to be heated along a path through said heating station, a pair of high frequency electrical conductors in said heating station extending in a plane below and parallel to the path of movement of said article through said station, and a source of high frequency electrical current connected to said conductors whereby high frequency electrical current will flow through said conductors in mutually opposite directions; the improvement comprising in that said conductors are symmetrically positioned with respect to said path of movement through the length of said station, in that each said conductor extends in a direction which is uniformly inclined at a constant angle to a portion of the path of movement of said article through said heating station, and in having a guide plate in a plane spaced above said conductors and parallel to said path of movement of said article through said heating station to form an unobstructed space through which said article may move with said plate being adapted to limit movement of the article away from said conductors due to any repulsion effect between said article and said conductors when high frequency current flows through said conductors.

4,288,674

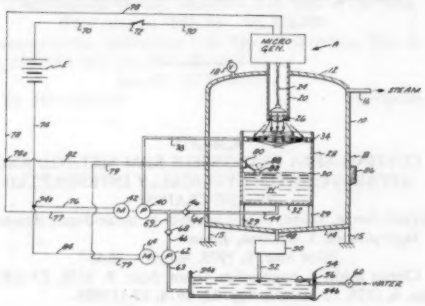
MICROWAVE ACTUATED STEAM GENERATOR

Graham D. Councell, 8242 Brookgreen Rd., Downey, Calif. 90240

Filed Apr. 21, 1980, Ser. No. 142,103

Int. Cl.³ H05B 6/80

U.S. Cl. 219—10.55 A **5 Claims**



1. In a steam generator having a boiler in the form of a hollow pressure vessel that has a top and bottom; a steam outlet in communication with the upper interior of said boiler; a pressure relief valve in communication with the upper interior of said boiler; a condensate drain in said bottom, a microwave generator; and a microwave emitter energized by said microwave generator, said emitter located in the upper interior of said boiler; and a source of water; and a source of electric power; the improvement for generating steam in said boiler, said improvement including:

a. a plurality of circumferentially spaced nozzles arranged as a horizontal ring in the upper interior portion of said boiler below said microwave emitter, said nozzles when supplied water under pressure transforming the latter to a plurality of sprays of fine droplets thereof, said sprays being directed horizontally towards one another to define a circular spray area on which microwaves from said emitter impinge to transform a first portion thereof to steam and a second portion of said droplets moving downwardly in said boiler by gravity;

b. a first pump and a first electric motor that drives the same, said pump having a first discharge outlet and a first suction inlet;

c. a container in said boiler below said nozzles that receives said second portion of said droplets that coalesce therein to a body of water in said container, and said microwaves that do not vaporize droplets impinging on said body of water to heat the same;

d. a first electric circuit extending from said source of electric power to said microwave generator and said first motor to concurrently energize said generator and motor;

e. a first conduit means that conducts water from said first discharge outlet to said nozzles to be transformed to said sprays;

f. a second conduit means that conducts water from said

container to said first suction inlet of said first pump to be recirculated to said nozzles to again be formed into said sprays;

g. a second pump and electric motor that drives the same, said second pump including a second discharge outlet and second suction inlet;

h. water level elevation sensing means in said container that becomes conductive only when said water level falls below a predetermined elevation;

i. third conduit means that connect said second suction inlet to said source of water;

j. fourth conduit means that connect said second discharge outlet to said second conduit;

k. a second electric circuit connected to said source of electric power and including said water level sensing means and said second motor, with said second pump being driven to supply make-up water to said first pump only when said water level in said container falls below said predetermined elevation; and

l. a steam trap in communication with said drain for discharging steam condensate to the exterior of said boiler.

4,288,675

CUTTING AREA RESPONSIVE EDM METHOD AND APPARATUS WITH CYCLICALLY INTERRUPTED PULSE TRAINS

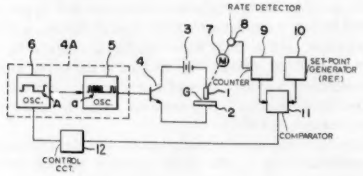
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Mar. 8, 1979, Ser. No. 18,637

Claims priority, application Japan, Mar. 9, 1978, 53-26822; Sep. 6, 1978, 53-109493; Sep. 12, 1978, 53-111986

Int. Cl.³ B23P *1/02*

U.S. Cl. 219—69 M **15 Claims**



1. A method of electrical-discharge machining of a workpiece juxtaposed with a tool electrode across a dielectric-filled machining gap with machining surfaces of variable area as the tool electrode is advanced relatively toward the workpiece so as to maintain the gap spacing therebetween substantially constant, the method comprising the steps of:

applying across said machining gap pulse trains individually consisting of elementary pulses of predetermined on-time τon and off-time τoff, the pulse trains having a duration Ton constituting a first time element and the successive trains being separated by a cut-off interval Toff constituting a second time element;

sensing the instantaneous area of said machining surfaces during application of said pulse trains across said machining gap; and

controlling at least one of said time elements in accordance with said sensed machining area so as to maintain the current density along said machining surfaces substantially constant in spite of change in said machining area during relative advance of said electrode.

4,288,676

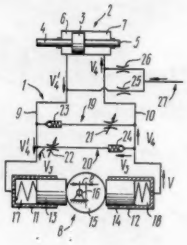
METHOD OF CONTINUOUS FLASH BUTT WELDING AND HYDRAULIC DRIVE OF CONTINUOUS FLASH BUTT-WELDING MACHINE FOR REALIZATION OF THIS METHOD

Sergei I. Kuchuk-Yatsenko, ulitsa Filatova, 1/22, kv. 47; Ivan A. Chernenko, ulitsa Vladimirskaya, 98/3, kv. 45; Mikhail V. Bogorsky, ulitsa Ozernaya, 30/51, kv. 120; Alexandr I. Kulesh, prospekt 40 let Oktyabrya, 114, korpus 2, kv. 59; Vitaly T. Cherednichok, Zadorozhny pereulok, 6, kv. 42, and Vladimir I. Tishura, ulitsa Chigorina, 55, kv. 27, all of Kiev, U.S.S.R.

Filed Jan. 19, 1979, Ser. No. 4,713

Int. Cl.³ B23K *11/04*

U.S. Cl. 219—100 **4 Claims**



1. A method of continuous flash butt welding comprising: bringing together and moving apart the workpieces to be welded by imparting to at least one of them an oscillatory rectilinear motion along the line of bringing them together and moving apart with the amplitude in the movement of said at least one workpiece in the direction towards the other of said workpieces greater than the amplitude in the movement of the same said workpiece in the direction of moving apart, applying voltage to said workpieces being welded for flashing and heating the workpieces in the course of bringing them together and moving apart, and subsequently applying an upset force to said workpieces being welded.

4,288,677

WELDING METHOD OF TURBINE DIAPHRAGM

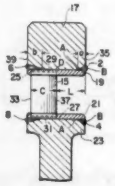
Shinji Sakata; Hirakazu Yokota; Tasuku Shimizu, all of Hitachi, and Yasuhiko Otawara, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 1, 1979, Ser. No. 80,458

Claims priority, application Japan, Sep. 29, 1978, 53/119391

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 ED **5 Claims**



1. A welding method of a turbine diaphragm comprising outer and inner wheels, a pair of spacers, and a plurality of nozzle blades secured between the spacers, the method comprising the steps of:

arranging the pair of spacers with the pluralty of nozzle blades between the outer wheel and the inner wheel so that the pair of spacers are fitted between the outer and

inner wheels to provide abutments between the outer and inner wheels and the pair of spacers;

welding along the abutments between the outer and inner wheels and the pair of spacers at an inlet side of the turbine diphragm at which a motive fluid enters the turbine diaphragm, so that a weld depth from the inlet side of the turbine diaphragm will be at most 0.5 L, wherein L is a distance between the inlet side of the turbine diaphragm and a tip of the nozzle blades; and

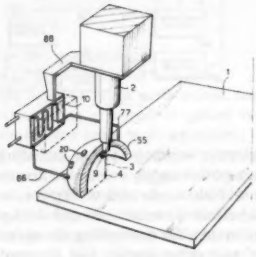
welding along the abutments between the outer and inner wheels and the pair of spacers at an outlet side of the turbine diaphragm at which the motive fluid exits the turbine diaphragm so that a weld depth at the outlet side will be at least 0.3 C, wherein C is a height of the nozzle blades.

4,288,678

APPARATUS FOR TREATING METAL WORKPIECES WITH LASER RADIATION

Aldo V. La Rocca, Moncalieri, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Feb. 28, 1980, Ser. No. 125,315
Claims priority, application Italy, Mar. 5, 1979, 67467 A/79
Int. Cl.³ B23K *7/00*
U.S. Cl. 219—121 LE **3 Claims**



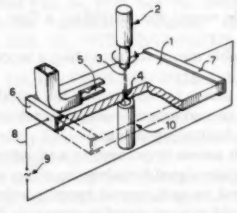
1. Apparatus for treating a metal workpiece with laser radiation, comprising a laser radiation generator arranged to generate and focus a laser beam onto a point on said workpiece, reflecting means arranged to refocus onto said point on said workpiece the radiation reflected therefrom and sensing means attached to said reflecting means for measuring physical and chemical parameters of the treated area of the workpiece by measurements of the radiation which reaches the said reflecting means after being reflected from the treated area of the workpiece.

4,288,679

METHOD OF MICRODRILLING METAL WORKPIECES USING A POWER LASER

Aldo V. La Rocca, Moncalieri, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Feb. 28, 1980, Ser. No. 125,317
Int. Cl.³ B23K *26/16*
U.S. Cl. 219—121 LL **3 Claims**



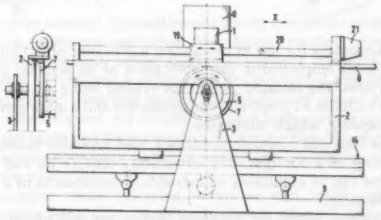
1. A method for microdrilling a hole in a metal workpiece using a power laser beam the action of which causes solid workpiece metal to be transformed into both liquid and vapour phases, said method including the operation of heating the workpiece to a temperature sufficient to cause both the liquid phase formed directly by the action of the laser beam and the liquid phase caused by the condensation of the vapour phase on the wall of the hole being formed, to be maintained in the liquid state for a period of time long enough to permit the uniform spreading of these liquid phases over the wall of the hole wherein said heating is accomplished by directing a plasma torch of a neutral gas along the axis of said laser beam, onto the face of the workpiece opposite that on which the laser beam acts whereby upon the formation of a through hole in the workpiece by the action of the laser beam, the plasma jet serves to effect further spreading of the liquid phases over the wall of the hole.

4,288,680

APPARATUS FOR CUTTING MOULD NOTCHES FOR STRIP STEEL CUTTING TOOLS

Walter Röder, Frankfurt, Fed. Rep. of Germany, assignor to R + S Stanzformen GmbH, Frankfurt, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,390
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2909140; Dec. 13, 1979, 2950149
Int. Cl.³ B23K *26/08*
U.S. Cl. 219—121 LG **13 Claims**



1. Apparatus for cutting notches in the outer circumferential surface of a hollow cylindrical drum to allow sheet steel strips to be fitted in the notches in the drum to form a cutting tool, each of the steel strips having a cutting edge of a desired length which edge is positioned a certain radial distance outwardly from the outer circumferential surface of the drum to define a cutting edge diameter, comprising a machine frame, a laser cutting set for providing a laser beam extending in a certain direction for cutting the notches in a drum, a carriage for supporting said laser cutting set, said carriage being movable on said machine frame along two mutually perpendicular axes which define the plane of movement for said carriage, a mounting shaft on said carriage adapted to support a drum coaxial with the axis of said mounting shaft for rotating the drum about the axis of said mounting shaft, said mounting shaft extending perpendicularly of the certain direction of the laser beam and parallel to one of the axes along which said carriage is movable and spaced from the plane of movement of said carriage, a drive wheel coaxially fixed to said mounting shaft for rotating said mounting shaft, said drive wheel having a radially outer circumferential engagement surface being adapted to correspond to the cutting edge diameter of the sheet steel strips to be fitted into the drum adapted to be supported on said mounting shaft, and an elongated guide member fixed to said machine frame and extending parallel to said plane of movement of said carriage for contacting said engagement surface and rotating said drive wheel for rotating a drum mounted on said mounting shaft when said carriage is moved relative to said guide member so that the length of notches cut by the laser beam in the outer circumferential surface of the drum mounted on said mounting shaft in a direction transverse of the axis of said

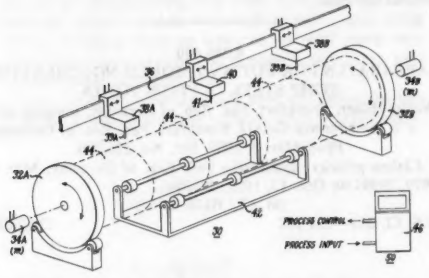
mounting shaft are shorter than the comparable lengths of the cutting edges of the steel strips to be fitted into the transversely extending notches in accordance with the relation between the radial dimensions of the cutting edge and the outer circumferential surface of the drum from the axis of said mounting shaft.

4,288,681

APPARATUS FOR FABRICATING ISOLATED PHASE BUS

Roy A. Niemann, Aston, Pa., assignor to General Electric Company, Philadephia, Pa.

Filed Jan. 30, 1979, Ser. No. 7,546
Int. Cl.[3] B23K 9/12
U.S. Cl. 219—125.11 **14 Claims**



1. Apparatus for use in processing a plurality of cylindrical workpieces employed in the fabrication of an isolated phase bus system, the isolated phase bus system being of the type which includes a cylindrical bus conductor and a mating enclosure therefor, which comprises:

(a) at least one rotatable headstock, said rotatable headstock being of a configuration to securely receive an end of a first one of a plurality of cylindrical workpieces of a first diameter;

(b) support means for rotatably supporting said plurality of cylindrical workpieces when said plurality of cylindrical workpieces are disposed in end-to-end manner such that the longitudinal axes thereof are substantially coincident;

(c) a side beam adjacent to said headstock and extending along a line parallel to the axis of rotation of said rotatable headstock;

(d) controllable workpiece welding means coupled to said side beam, said welding means being capable of linear translation along the length of said side beam;

(e) controllable workpiece cutting means comprising a cutting torch coupled to said side beam, said cutting means being capable of linear translation along the length of said side beam independently of said welding means;

(f) drive means, which includes:

(i) controllable first drive means for rotating said headstock so that the cylindrical workpiece secured thereto is caused to rotate about its longitudinal axis,

(ii) controllable second drive means for causing said welding means to translate along said side beam;

(iii) controllable third drive means for causing said cutting means to translate along said side beam independently of said welding means; and

(g) processing control means, which includes:

(i) first control means for controlling said first drive means;

(ii) second control means for controlling said second drive means and the activation of said welding means into welding operation;

(iii) third control means for controlling said third drive means and the activation of said cutting means into cutting operation and operable to activate said cutting means while said cutting means is being translated along said side beam; and

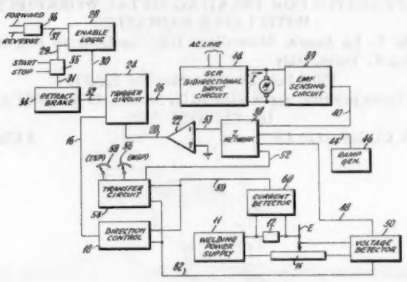
(iv) fourth control means for coordinating said first, second and third control means (a) to weld a plurality of said cylindrical workpieces together in end-to-end manner and (b) to then cut a plurality of openings in said welded-together workpieces, said welding locations and said openings being substantially precisely located in a predetermined reproducible manner.

4,288,682

WELDING SYSTEM WITH REVERSIBLE DRIVE MOTOR CONTROL

Tibor E. Toth, Florence, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 28, 1979, Ser. No. 98,065
Int. Cl.[3] B23K 9/12
U.S. Cl. 219—137.71 **6 Claims**



1. An electric welding system including an electrode, a workpiece, a power supply connected in series circuit relationship with said electrode and workpiece, a drive motor for feeding said electrode relative to said workpiece and a governor control system for controlling the speed and direction of rotation of said drive motor, said governor control system comprising:

a source of driving potential;

a bi-directional circuit including a first circuit drive means for connecting said source of driving potential across said drive motor in a first direction and a second circuit drive means for connecting said source of driving potential across said drive motor in a second direction opposite said first direction;

means for generating a current signal in response to the presence of current in said series circuit;

means responsive to arc voltage for generating a first voltage signal when the arc voltage is above a predetermined magnitude and a second voltage signal which varies in magnitude in proportion to variation in arc voltage;

means for generating a direction signal having a first logical output state in response to the presence of said first voltage signal and having a second logical output state in response to the absence of said first voltage signal;

logic means for enabling said first and second circuit drive means in response to the logical output state of said direction means;

first adjustable means for providing a first speed control signal;

second adjustable means for providing a second speed control signal;

speed control means for controlling the speed of the motor in response to said second voltage signal and to said first and second control signals; and

transfer circuit means responsive to said current signal and said first voltage signal for inhibiting either said first speed control signal or said second speed control signal such that when said current signal is present in the absence of said first voltage signal said second speed control signal is

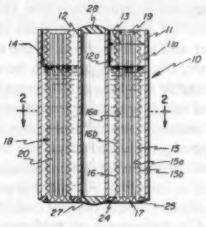
inhibited and when both said current and voltage signals are present said first speed control signal is inhibited.

4,288,683

INSULATING POROUS MATRICES FOR ELECTRODE BOILERS

Fritz G. Will, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,373
Int. Cl.³ H05B *3/60*; F22B *1/30*
U.S. Cl. 219—290 **20 Claims**



1. An electrode boiler comprising:

a first electrode having a major surface area;

a second electrode having a major surface area, said first and second electrodes being arranged in spaced relationship with said major surface areas in juxtaposition;

first and second spaced, porous electrically insulating support walls disposed between and spaced from each of said electrodes, each support wall having a major surface, said first support wall being disposed such that its major surface is in spaced juxtaposition with said major surface area of said first electrode, and said second support wall being disposed such that its major surface is in spaced juxtaposition with said major surface area of said second electrode; and

a plurality of electrically insulating members disposed between said walls, said members being arranged to provide paths exhibiting a high resistance to electrical current flow along a direction generally perpendicular to said major surfaces of said walls and paths exhibiting a low resistance to fluid flow along a direction generally parallel to said major surfaces of said walls; the space between each electrode and the respective juxtaposed support wall being free of said insulating members to form a considerably lower electrical resistance zone which reduces steam formation and arcing.

4,288,684

ELECTRODE TYPE STEAM VAPORIZER

Hisao Katou, and Yoshiya Sakata, both of c/o TDK Electronics Co., Ltd., 14-6, Uchikanda 2-chome, Chiyoda-ku, Tokyo, Japan

Filed Feb. 24, 1978, Ser. No. 880,981
Claims priority, application Japan, Oct. 18, 1977, 52/138713[U]; Oct. 18, 1977, 52/138714[U]; Oct. 22, 1977, 52/127161
Int. Cl.³ H05B *3/60*; F22B *1/30*
U.S. Cl. 219—295 **7 Claims**

1. An electrode type steam vaporizer comprising:

a container body forming a water receptacle, said container body including a surface;

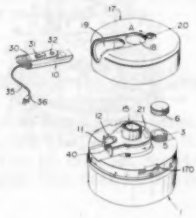
an electrode unit having one end extending into said container body and fittable into an aperture of said surface and another end extending from said container body, said electrode unit including a power source connection external of and adjacent to said body for supplying power to said electrode unit whereby said water in said receptacle is vaporized;

a steam nozzle formed on the other end of said electrode unit;

a removable power source connector adapted to be connected to said power source connection;

a water inlet on said surface;

a cover member covering said surface, said cover including a portion adapted to receive said removable power source connector and to provide access for said power source connector to said power source connection of said electrode unit, wherein said cover member includes an aperture through which said power source connector extends when connected to said power source connection, said



cover member and said power source connector cooperating to prevent said cover from being removed from said container body when said power source connector and said power source connection are connected together;

cooperable releasable stopper means on said power source connector and one of said container body surface and said electrode unit for preventing the connection of said power source connector to the power source connection of said electrode unit; and

a stopper means releasing means on said portion of said cover member, said releasing means adapted to contact and release said releasable stopper means when said power source connector is inserted into said portion of said cover and said cover member is enclosing said surface.

4,288,685

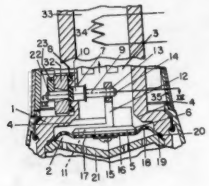
FLOW-ACTIVATED RESISTANCE HEATER FOR WATER

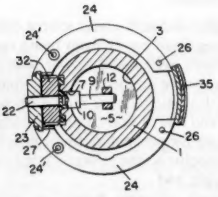
Helio Tommaso, Atibaia, Brazil, assignor to Produtos Eletricos Corona Ltda., Brazil

Filed Mar. 12, 1979, Ser. No. 19,839
Int. Cl.³ H05B *1/02*; H01H *35/40*; F24H *1/10*
U.S. Cl. 219—309 **3 Claims**

1. In an apparatus for heating water including a hollow body through which a stream of water is permitted to flow, said body defining a heating chamber in which is positioned an electrical resistance heater, said body also having a receiving chamber therein for receiving the inflowing water and an intermediate duct for providing flow of water from said receiving chamber into said heating chamber, and activator means for energizing the resistance heater only in response to the flow of water into said receiving chamber, said activator means including piston means movably positioned within said body for effectively separating said receiving chamber from said intermediate duct, said piston means having small opening means associated therewith for restricting flow of water from said receiving chamber into said intermediate duct, said piston means being normally maintained in an inactive position under nonflow conditions and being moved a limited extent into an activated position in response to flow of water into said receiving chamber, electrical switching means positioned exteriorly of said body for selectively energizing or de-energizing said resistance heater, and lever-type link means operatively connected between said piston means and said switch means for activating said switch means to energize said heater when said piston means is moved into its activated position responsive to

flow of water, said link means having a portion thereof projecting into said intermediate duct and operatively connected to said piston means, said link means projecting through the wall of said body and having a portion thereof projecting exteriorly of said body for operative cooperation with said switch means, the improvement wherein said body includes a tubular portion defining therein said intermediate duct, said switch means including a pair of stationary contacts disposed exteriorly of said tubular portion adjacent one side thereof, said switch means including a further pair of movable contacts disposed closely adjacent and in opposed relationship to said fixed contacts, said movable contacts being connected to and movable by a carrier which is movably supported adjacent the exterior of said tubular portion for movement in a direction





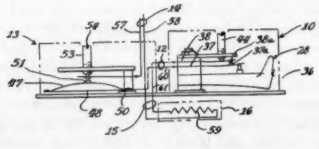
substantially parallel with the axis of said tubular portion, said carrier being connected to the exteriorly projecting portion of said link means, said movable contacts being associated with a pair of substantially semicircular springlike conductive plates which are disposed in opposed relationship and substantially encircle the tubular portion, said carrier being connected between said springlike plates adjacent one end thereof and said movable contacts also being disposed adjacent said one end of said springlike plates, the other opposed ends of said springlike plates being fixedly positioned relative to said body and disposed relative to said tubular portion substantially diametrically opposite from said carrier, one said pair of contacts being electrically connected to said heater, and the other said pair of contacts being joined to a source of electrical energy.

4,288,686

THERMOSTAT FOR POPCORN COOKING CONTAINERS OR THE LIKE

Charles D. Cretors, Lake Forest, Ill., assignor to C. Cretors and Company, Chicago, Ill.

Filed Dec. 17, 1979, Ser. No. 104,569
Int. Cl.³ H05B 1/02
U.S. Cl. 219—512 **9 Claims**



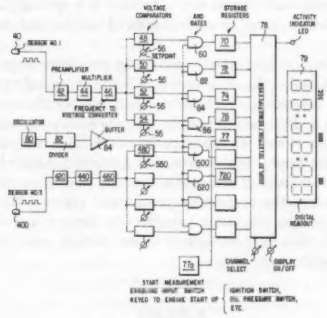
1. In a cooking apparatus for popcorn popping or the like, including a cooking container, an electric heating element for heating said container and a cooking temperature thermostat mounted on said container and connected in series with said electrical heating element, said cooking temperature thermostat being arranged to open when the temperature reaches a preset value and to close when the temperature drops below a value somewhat below the preset value, a safety thermostat arranged to be mounted directly on said cooking container for connection between said cooking temperature control thermostat and said heating element, said safety thermostat comprising: a support structure arranged to be firmly mounted on said cooking container, a temperature sensitive member having a first portion secured to said support structure to directly receive heat from said container through said support structure and having a second portion movable relative to said first portion in proportion to the temperature of said temperature sensitive member and in proportion to the temperature of said cooking container, trip means operable between a stable reset condition and a stable tripped condition and connected to said second portion of said temperature sensitive member for operation by said temperature sensitive member from a reset condition to said tripped condition when the temperature of said temperature sensitive member is at a certain high temperature of on the order of at least 500° F., said trip means being thereafter operative to remain in said tripped condition irrespective of lowering of the temperature of said temperature sensitive member to a temperature of on the order of 70° F. or less, and electric switch means including said electrical contacts connected to said trip means for operation therefrom.

4,288,687

MULTIPOINT DIGITAL TACHOGRAPH

Michael J. Zinn, Noblesville, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Filed Aug. 16, 1979, Ser. No. 67,171
Int. Cl.³ G07C 1/04
U.S. Cl. 235—92 T **4 Claims**



1. A multipoint digital tachograph system for measuring, storing, and displaying the amount of total time as well as time spent at or above multiple points of interest, such as at pre-programmed rotational speeds of two rotary elements, the rotary elements rotating at different but related speeds, the system including a channel for each rotary element, each channel including,

(a) a sensor for sensing and converting to pulses the rotational speed of a rotary element,

(b) means for converting the pulses to a voltage, to thereby obtain a voltage proportional to rotary speed,

(c) a plurality of voltage comparators each coupled to receive said rotary speed voltage, each comparator passing a signal only after a predetermined reference voltage associated with it has been fed to it,

(d) a plurality of AND gates each having means for energizing one input terminal thereof and having its other termi-

nal coupled to an associated one of said voltage comparators, whereby each AND gate opens and passes a signal to its output terminal only when and after its associated voltage comparator passes a signal responsive to equality between the predetermined reference voltage and the said rotary speed voltage,

(e) a plurality of storage registers each coupled to a respective one of said AND gates, each register storing the time its associated AND gate passes a signal from the latter's output,

(f) means for selectively reading and for displaying the information in a selected one of the storage registers,

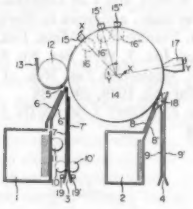
(g) whereby the operation time of each rotary element, at or above a desired rotary speed as well as the total time of operation, may be displayed for inspection.

4,288,688

TOLL ROAD TERMINAL MACHINE

Yosito Kiyama; Shinichi Tachibana, both of Kobe; Riichiro Yamashita, Kakogawa, and Takeshi Horino, Yokohama, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Matsushita Tsushin Kogyo Kabushiki Kaisha, Kanagawa, both of, Japan

Filed Mar. 13, 1979, Ser. No. 20,232
Claims priority, application Japan, Mar. 17, 1978, 53-29957
Int. Cl.³ G07B *15/02*; G06K *13/00*
U.S. Cl. 235—384 **3 Claims**



1. A toll road machine for issuing transit tickets when used at an entrance gate and for verifying transit tickets when used as an exit gate, each of said transit tickets having a magnetic recording zone adapted for writing information thereon and for reading out information therefrom, and having a printing zone adapted for printing information thereon; said machine comprising:

a transit ticket hopper for storing a plurality of unused transit tickets;

an insertion port for manually inserting a transit ticket having a previously recorded magnetic recording zone;

a joining conveyor section and a main conveyor section, and joining conveyor section for conveying either one of said plurality of transit tickets stored in said transit ticket hopper or said transit ticket inserted into said insertion port to said main conveyor section, said main conveyor section comprising a magnetic head means for writing information on the magnetic recording zone of said transit ticket conveyed thereto and for reading information from the magnetic recording zone of said transit ticket conveyed thereto and comprising printing means for printing information on the printing zone of said transit ticket conveyed thereto;

a stacker means for storing transit tickets;

an ejection port for ejecting transit tickets;

a separating conveyor section connected to said main conveyor section for conveying transit tickets from said main conveyor section to either said stacker means or to said ejection port;

a conveyor control means and an information control means, operatively electrically connected to each other and to said main and separating conveyor sections, and a manual input means operatively electrically connected to said conveyor control and information control means;

wherein when said machine is used as an entrance gate, said machine issues one of said plurality of transit tickets stored in said transit ticket hopper by ejection through said ejection port subsequent to the writing of information on the magnetic recording zone and the printing of information on the printing zone thereof by said main conveyor section in conjunction with said conveyor control and information control means; and

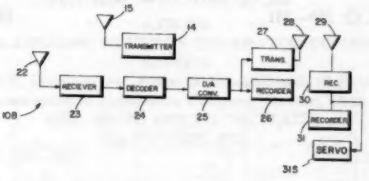
wherein when said machine is used as an exit gate, said machine verifies a transit ticket manually inserted in said insertion port by reading the information written on the magnetic recording zone thereof by said main conveyor section in conjunction with said conveyor control and information control means and then stores said inserted transit ticket in said stacker means.

4,288,689

AUTOMATIC VEHICLE IDENTIFICATION SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840, and Christian Grund, 2035 Burr Ave., Bronx, N.Y. 10461

Filed Oct. 12, 1979, Ser. No. 84,429
Int. Cl.³ G06K *7/00*; B61L *21/00*; G01S *9/56*
U.S. Cl. 235—435 **14 Claims**



1. A method of identifying a moving object such as a traveling vehicle comprising:

disposing on said object an electrical circuit means defined by a plurality of circuit elements capable of modulating a short wave receiver in a specific manner including the generation of a code which generated code is unique to said object,

moving said object past a detection station containing a source of radio frequency energy, a short wave receiving means and a code detection means connected to said receiving means, detecting said object as it moves past said detection station and generating a control signal upon effecting such object detection and applying said control signal to effect the energization of said short wave receiving means, said code detection means and said source of radio frequency energy to cause said source to generate a radio frequency field and applying energy from said field to said electrical circuit means on said object whereby said detection means detects the code defined by said plurality of circuit elements of said electrical circuit means,

generating signals on the output of said detection means, which signals define information representative of such code, and

identifying said objects as it moves past said detection station by applying said code signals to activate a transducing means operable to effect such object identification.

4,288,690

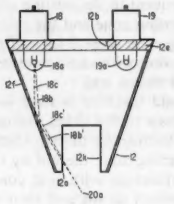
ILLUMINATION SYSTEM

Medford D. Sanner, Irving, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Filed Oct. 29, 1979, Ser. No. 88,963
Int. Cl.³ H01J *3/14*
U.S. Cl. 250—216 **4 Claims**

1. Improvement in a data field illuminator for uniformly

brightening a data field viewed by a photo sensor array in an optical character recognition system wherein the illuminator has side walls converging from an enclosure plate to a first



aperture, the improvement comprising two additional apertures in opposite side walls of said illuminator, said apertures adjacent to said first apertures.

4,288,691

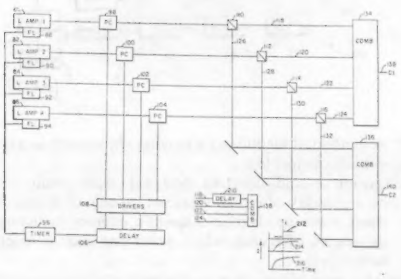
LASER PULSE SHAPING

James A. Horton, Kennewick, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Dec. 19, 1977, Ser. No. 861,941

Int. Cl.[2] B01D *59/44;* G02F *1/16*

U.S. Cl. 250—281 **19 Claims**



1. A system for pulse shaping pulsed radiation employed in photoexcitation comprising:

means defining an environment of particles;

a source of pulsed radiation;

means responsive to the pulsed radiation from said source for segmenting each pulse of radiation into temporally distinct segments;

means for separating the segments onto separate paths; and

means for applying the pulse segments on at least one of the different paths for producing photoexcitation of particles of said environment.

4,288,692

BEAM CURRENT NORMALIZATION IN AN X-RAY MICROANALYSIS INSTRUMENT

Frederick H. Schamber, and Jon J. McCarthy, both of Middleton, Wis., assignors to Tracor Northern, Inc., Middleton, Wis.

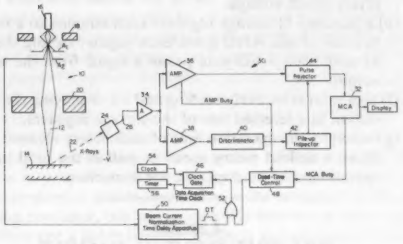
Filed Aug. 6, 1979, Ser. No. 63,734

Int. Cl.[3] G01N *23/00*

U.S. Cl. 250—310 **15 Claims**

1. In an electron column instrument for quantitative energy dispersive x-ray microanalysis including an optical system for establishing a focused electron beam of a preset beam current level directed onto an analysis specimen, means for analyzing the spectrum of x-rays emitted from the specimen to accumulate a count of x-ray intensities, and an elapsed time counter for timing out an analysis time period, the improvement comprising:

a beam current sensor for monitoring electron beam current stability; and



means for introducing delay time in the elapsed time counting of the analysis time period as a function of electron beam current stability to control the time of actual data accumulation such that x-ray spectral data is acquired over a defined beam current integral.

4,288,693

NONDISPERSIVE INFRARED GAS ANALYZER

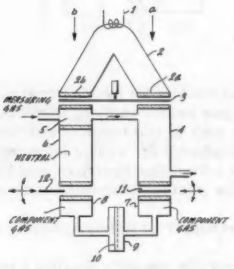
Walter Fabinski, Kriftel, and Udo Deptolla, Ober Olm, both of Fed. Rep. of Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 7, 1979, Ser. No. 46,549

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 2827345; Mar. 12, 1979, 2909688

Int. Cl.[3] G01J *1/00;* G01N *21/25*

U.S. Cl. 250—345 **6 Claims**



1. Nondispersive infrared gas analyzer which includes a particular component in a host gas, the host gas including at least one component having one or more infrared absorption bands which overlap an infrared absorption band of the particular component, the analyzer including a measuring beam path and a reference beam path and some means for providing infrared radiation beams of the same frequency band to the two paths, further including modulating means for the beams, the improvement comprising in combination:

a first, relatively short cell, being passed through by the gas to be analyzed and being disposed in one of said paths;

a second, relatively long cell, being also passed through by the gas to be analyzed and being disposed in another one of said paths;

a pair of receiver cells disposed respectively in said paths and being filled with the gas of said particular component;

differential pressure-sensing means coupled to the receiver cells and producing a signal representative of the concentration of the particular component in the host gas; and

an interference filter in the beam path which includes the second, long cell, the filter having an absorption charac-

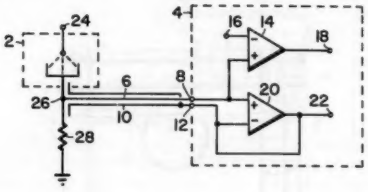
teristic for a range of said overlapping absorption bands, but passing nonoverlapping portions of the absorption bands of the particular component, the filter having a disposition to permit a portion of the respective beam to pass without filtering.

4,288,694

HIGH-IMPEDANCE IGFET INPUT CIRCUIT SUITABLE FOR SMOKE DETECTOR I.C.

Richard W. Ahrons, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 2, 1977, Ser. No. 847,975
Int. Cl.[3] G01T *1/18*
U.S. Cl. 250—374 **12 Claims**



1. An electronic circuit for the transmission of an electrical signal in which the effect of leakage paths is reduced comprising:

(a) input terminal means for receiving said electrical signal,

(b) amplifier means coupled to said input terminal means for generating an output voltage signal having a voltage substantially equal to the voltage of said electrical signal,

(c) a first conductor coupled to said input terminal means for conducting said electrical signal, and

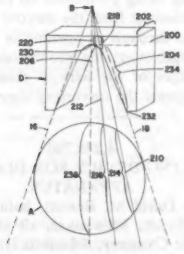
(d) a second conductor coupled to said amplifier means for conducting the output voltage signal, and disposed in close proximity to said first conductor for maintaining said input terminal means at a high impedance.

4,288,695

COMPUTERIZED TOMOGRAPHIC SCANNER WITH SHAPED RADIATION FILTER

Ronald G. Walters, Aurora, and Roland W. Carlson, Lyndhurst, both of Ohio, assignors to Technicare Corporation, Cleveland, Ohio

Filed Apr. 13, 1979, Ser. No. 29,877
Int. Cl.[3] G01N *23/02*; G21F *3/02*
U.S. Cl. 250—445 T **20 Claims**



1. An apparatus for reconstructing an image of at least a region of an object positioned in a scan circle comprising:

a source of radiation having a polychromatic spectrum for irradiating the scan circle with a beam radiation from a plurality of directions;

at least one radiation detector positioned to receive radiation from said source which beam of radiation has traversed the scan circle along a plurality of paths through the scan circle;

a radiation filter positioned between the source of radiation and the detector;

data collection means for collecting data indicative of the intensity of radiation received by said at least one radiation detector along the plurality of paths and organizing the collected data into data lines, said data collection means operatively connected with said at least one detector;

beam hardness correction means for adjusting said data lines for non-linearities introduced by the polychromatic spectrum of radiation from the source of polychromatic radiation;

filter correction means for adjusting said data lines for non-linearities introduced by alterations to the polychromatic spectrum of the radiation caused by said radiation filter, said beam hardness correction means and said filter correction means being operatively connected with said data collection means; and

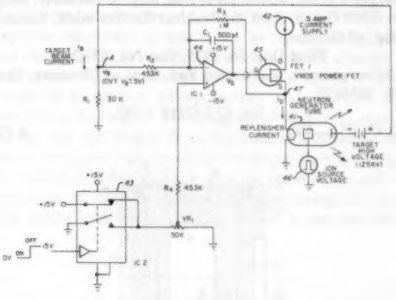
reconstruction means for reconstructing the data lines into a representation of an image of said region, said reconstruction means being operatively connected with said beam hardness correction means and said filter correction means.

4,288,696

WELL LOGGING NEUTRON GENERATOR CONTROL SYSTEM

Harold E. Peelman, and James R. Bridges, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 29, 1979, Ser. No. 53,627
Int. Cl.[3] G21G *4/02*
U.S. Cl. 250—502 **8 Claims**



1. A control system for controlling the output of a sealed off generator tube having a target material, an ion source, and a replenisher pressure regulator, comprising:

means for monitoring the average target current of said tube and for developing a voltage signal representative thereof;

means for comparing a function of said average target current representative signal with a reference voltage signal and for developing a control voltage signal representative of the comparison of said signals, said comparing means including an operational amplifier and means for summing said target current representative signal and a voltage signal representative of the replenisher current of said tube to form a summation signal and for comparing said summation signal and said reference voltage signal in said operational amplifier to provide an output control signal; and

control means, responsive to said control signal, for controlling current flow to the replenisher of said tube as a function thereof.

4,288,697

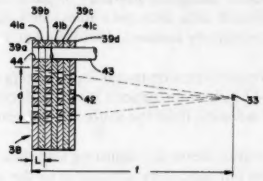
LAMINATE RADIATION COLLIMATOR

Richard D. Albert, 317 Hartford Rd., Danville, Calif. 94526

Filed May 3, 1979, Ser. No. 35,733

Int. Cl.³ G02B *5/00*; G21K *1/00*; H01J *1/52*

U.S. Cl. 250—505 **12 Claims**



1. A radiation collimator defining a plurality of spaced apart radiation transmissive paths separated by radiation absorbent regions for suppressing intercepted radiation other than intercepted radiation which is traveling along said plurality of paths, wherein said collimator is comprised of a plurality of sheets of material each extending across said plurality of paths, each of said sheets of material being formed of a lamination of radiation transmissive material having a lamination of radiation absorbent material on at least one surface, said lamination of radiation absorbent material of each of said sheets being transpierced by a plurality of spaced apart radiation transmissive passages, corresponding ones of said passages of each of said laminations of radiation absorbent material being aligned to establish said radiation transmissive paths of said collimator.

4,288,698

TRANSPORT AND STORAGE VESSEL FOR RADIOACTIVE MATERIALS

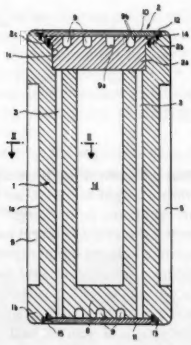
Henning Baatz, Essen; Dieter Rittscher, Heiligenhaus, and Jurgen Fischer, Essen, all of Fed. Rep. of Germany, assignors to GNS Gesellschaft für Nuklear-Service mbH, Essen, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 107,276

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1978, 2856620

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—506 **8 Claims**



1. A transport and storage vessel for radioactive material, especially nuclear power plant waste, comprising a cast receptacle of a gamma-radiation shielding material having vertical walls defining a compartment for receiving said radioactive material, a bottom and a cover closing said compartment, at least said vertical walls being formed with spaced apart longitudinal passages of circular section with a spacing between said passages being equal to at least twice the diameter of said passages, a neutron moderator filling said passages, the volume of said neutron moderator in said passages being at least equal to the volume of an imaginary layer of said material applied along the exterior of an equivalent vessel to achieve a predetermined attenuation of neutron emission.

4,288,699

STORAGE RACK FOR THE STORAGE OF FUEL ELEMENTS OF NUCLEAR REACTORS

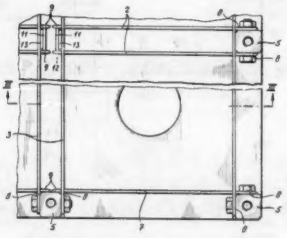
Adrianus van der Vlis, Vlaardingen, and Evert C. Boucherie, Kortgene, both of Netherlands, assignors to De Rotterdamsche Droogdok Maatschappij B.V., Rotterdam, Netherlands

Filed Apr. 6, 1979, Ser. No. 27,852

Claims priority, application Netherlands, Apr. 7, 1978, 7803742

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—507 **13 Claims**



1. A storage rack for the storage of fuel elements of nuclear reactors consisting of a sheet metal lattice arrangement constituting a plurality of abutting similar vertical storage cases having a rectangular cross section, characterized in that said lattice arrangement is constructed of a plurality of mutually substantially perpendicular sheet elements having a sharply shaped contour, the sheet elements in one of the two perpendicular directions being continuous traversing sheet elements forming walls and extending over the widths of a plurality of cases of the lattice arrangement, two adjacent traversing sheet elements being spaced at a mutual distance substantially corresponding with the width of a storage case and all sheet elements in the other of the two perpendicular directions being narrow sheet elements each extending only substantially over the width of one storage case, the narrow sheet elements at the opposite long edges thereof being provided with lugs protruding from the edges, the traversing sheet elements having openings formed therein for receiving the lugs, said lugs having openings extending therethrough for receiving wedges, the opening in the lug being positioned on the opposite side of a traversing sheet element from the narrow sheet element when the lug is inserted through an opening in the traversing sheet element, and wedges insertable into the openings in the lugs so that the long edges of the narrow sheet elements may be pressed tightly against the traversing sheet elements.

4,288,700

CABLE HANDLING DEVICE FOR DIAGNOSTIC X-RAY APPARATUS

Joseph J. Grass; David M. Barrett, both of Brookfield, and Randolph N. Wendt, Milwaukee, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 22, 1979, Ser. No. 86,881

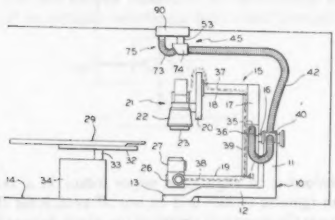
Int. Cl.³ H01J *35/16*; H02G *15/08*

U.S. Cl. 250—523 **6 Claims**

4. A device for handling a group of cables which extend in a room to and from x-ray equipment, said equipment including: An L-arm comprised of unitary vertical and horizontal sections, the horizontal section being supported on one end for enabling said section to rotate about a vertical axis in a horizon-

tal plane; a U-arm comprising a base section mounted on said vertical section of the L-arm for rotation in vertical planes about a horizontal axis and a pair of radially spaced apart arm sections projecting from said base section; and, x-ray imaging and x-ray source means mounted on said spaced apart arm sections, respectively, said cable handling device comprising:

axle means mounted above said equipment and generally horizontally extending boom arm means for supporting said cable group, said boom arm means being mounted to said axle means for swinging about a vertical axis and for supporting a portion of said cable group generally horizontally with another continuous portion of said cable group extending beyond the support of said boom arm means being disposed downwardly for coupling to said x-ray equipment,



a swivel mechanism having a passageway for enabling said group of cables to run generally vertically and then to become generally horizontal on said boom arm means, said swivel mechanism being rotatable about an axis that is spaced from the axis of said axle means,

a first flexible tubular enclosure surrounding the cable portion between said swivel means and said boom arm means and having one end fastened to said boom arm means and an opposite end fastened to said swivel means to enable relieving the twist which would be otherwise imparted to said tubular enclosure by swinging of said boom arm means, and

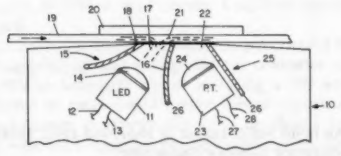
a second flexible tubular enclosure surrounding the portion of the group of cables extending between said boom arm means and said x-ray equipment.

4,288,701

MARK SENSING DETECTOR

Roy K. Hill, Bristol, Va., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 28, 1979, Ser. No. 107,968
Int. Cl.³ G06K *7/14*
U.S. Cl. 250—569 **11 Claims**



10. A method for sensing partially opaque marks on a fiber paper object comprising the steps of:

placing a mark to be sensed at a sensing station,

directing a source of high-intensity light through a portion of said mark and into the fibers of said paper object below said mark, and

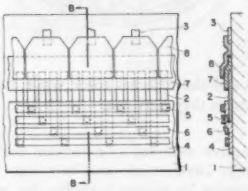
detecting the relative amount of light being transmitted transversely through said fibers of said paper object by detecting the light in a portion of said fibers at a point adjacent the portion of the mark being exposed to said high-intensity light.

4,288,702

IMAGE PICKUP DEVICE HAVING ELECTRODE MATRIX COUPLING

Takashi Ozawa, and Mutsuo Takenouchi, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1979, Ser. No. 94,619
Claims priority, application Japan, Dec. 18, 1978, 53-157826
Int. Cl.³ H01L *27/14, 31/00*
U.S. Cl. 250—578 **4 Claims**



1. An image pickup device comprising: a plurality of individual electrodes divided into a plurality of groups, said individual electrodes being provided on one surface of a photoconductive film; a plurality of common electrodes disposed on an opposite surface of said photoconductive film opposite said groups of individual electrodes respectively forming light receiving elements with said individual electrodes; and common conductors connecting in the form of a matrix said individual electrodes which are provided at corresponding positions respectively in said groups of individual electrodes, at least one of said individual electrodes and said common electrodes being transparent electrodes so that when an optical image is projected onto said light receiving elements signal charges provided by said light receiving elements are stored in a stray capacitor in a common wiring section, said common wiring section being formed on the substrate of said light receiving elements, and the length of each common conductor of the common wiring section is sufficiently longer than the length of each individual electrode such that the impedances and stray capacitances of wirings from said light receiving elements to matrix wiring ends are substantially equal to one another.

4,288,703

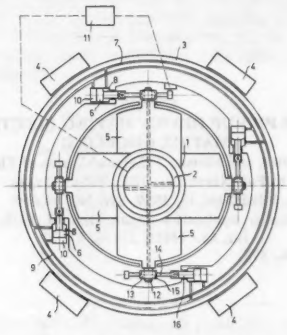
LARGE DIAMETER HYDROELECTRIC MACHINE

Friedrich Schneebeli, Oberengstringen, Switzerland, and Mario Biondetti, Schio, Italy, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Feb. 21, 1980, Ser. No. 123,465
Claims priority, application Switzerland, Feb. 26, 1979, 1857/79; Fed. Rep. of Germany, Jul. 16, 1979, 2933062
Int. Cl.³ F01D *15/10*; F03B *3/14, 13/00*
U.S. Cl. 290—52 **6 Claims**

1. An hydroelectric machine having an internal rotor comprising the turbine blades of an hydraulic machine and an external rotor comprising the rotor of an electric machine; a separate radial bearing for each of said rotors; an articulated coupling connecting the end of each turbine blade to the external rotor, said coupling permitting relative radial movement therebetween; and force compensating means connecting the

end of each turbine blade to the external rotor, said compensating means permitting circumferential movement between the



turbine blades and the external rotor while transmitting circumferential forces therebetween.

4,288,704

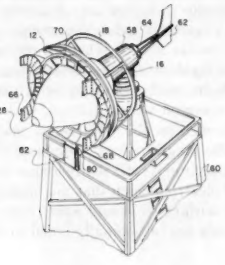
WIND DRIVEN GENERATOR WITH BLADE PROTECTING MEANS

James H. Bosard, 83-02 Dongan Ave., Elmhurst, N.Y. 11373

Filed Dec. 19, 1978, Ser. No. 970,837

Int. Cl.³ F03D *9/00;* **H02P** *9/04;* **F03D** *7/00;* **F03B** *13/00*

U.S. Cl. 290—55 **3 Claims**



1. An electric current producing windmill comprising a windwheel having blades thereon; a generator; a housing for said windwheel; said housing includes a front disc having an open circular area and a dished peripheral wall; a conical wind deflector mounted centrally of said disc, and forward of the windwheel, for deflecting wind to the outer part of said blades; a shaft having one end rotatably mounted inside the forward tip of said deflector; said windwheel being keyed thereon; the other end of said shaft being coupled to one shaft of the generator for rotating same; and a pair of perforated semi-circular shields, one of which is hinged on each side of said deflector; said shields linked to means to pivot said shields about their respective hinges to a closed position for automatically covering the space between the outer periphery of said deflector and the inner periphery of said wall when the wind velocity exceeds a given speed, said perforated shields allowing wind currents to flow through perforations in the shield so as to power the windmill and its coupled generator when the shields are in the said closed position.

4,288,705

MECHANISM FOR REGULATING A WIPER MOTOR IN A VEHICLE

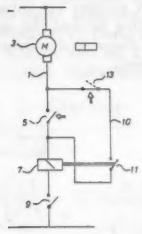
Heiko Barske, Ingolstadt, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union, Ingolstadt, Fed. Rep. of Germany

Filed Jan. 16, 1980, Ser. No. 112,424

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1979, 2902175

Int. Cl.³ G05D *3/10;* **H02H** *7/085*

U.S. Cl. 307—10 R **5 Claims**



5. Mechanism to regulate a wiper motor in a vehicle for which an ignition switch and an on/off switch for the wiper motor are in the electrical circuit of the wiper motor characterized by a holding circuit which is activated only by the turned on ignition switch and subsequently by the on/off switch and in this way activates the wiper motor and which discontinues when the ignition switch is turned off and also turns off the wiper motor.

4,288,706

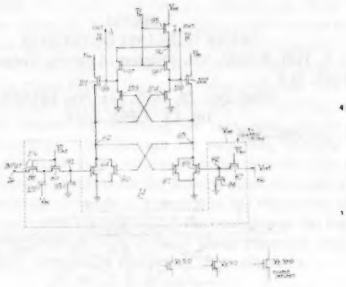
NOISE IMMUNITY IN INPUT BUFFER CIRCUIT FOR SEMICONDUCTOR MEMORY

Edmund A. Reese, Sugar Land; Lionel S. White, Jr., Houston, and Joseph C. McAlexander, III, Sugar Land, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 20, 1978, Ser. No. 953,052

Int. Cl.³ H03K *17/60*

U.S. Cl. 307—577 **6 Claims**



1. An input buffer circuit of improved noise immunity for a semiconductor memory comprising:

a bistable differential voltage detector having first and second field effect transistors, each having a source-to-drain path and a gate, the gates of the first and second transistors providing inputs to the detector,

means for coupling an input terminal to the gate of said first transistor,

means for coupling a reference voltage to the gate of said second transistor,

a pair of output transistors each having a source-to drain path and a gate with the source-to-drain paths being sepa-

rately connected in series between the source-to-drain paths of the first and second transistors and a clocked supply voltage,

third and fourth field effect transistors each having a source-to-drain path and a gate, the source-to-drain paths of the third and fourth field effect transsistors being separately connected from the gates of said pair of output transistors to reference potential, and the gates of the third and fourth transistors being connected to logic voltages from the output transistors,

means for improving noise immunity including means for increasing the threshold voltages of the third and fourth transistors to a level significantly higher than that of said pair of output transistors, wherein the threshold voltage of the first and second transistors is significantly less than that of an enhancement mode field effect transistor.

4,288,707

ELECTRICALLY VARIABLE IMPEDANCE CIRCUIT

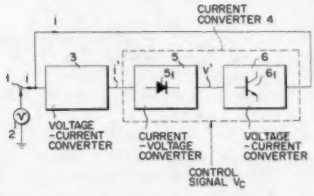
Masayuki Katakura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 8, 1979, Ser. No. 18,665

Claims priority, application Japan, Mar. 14, 1978, 53-28283; Nov. 9, 1978, 53-138243; Nov. 9, 1978, 53-138246

Int. Cl.³ H03H *11/00*

U.S. Cl. 307—264 **10 Claims**



1. An electrically variable impedance circuit comprising:

a voltage-current converter circuit having an input terminal receiving an input voltage signal for converting said input voltage signal into an output signal, said voltage-current converter circuit including means for keeping the conversion gain of said voltage-current converter circuit unchanged;

a current converter circuit having an output coupled to said input terminal of said voltage-current converter circuit, said current converter circuit including a PN junction connected to receive said output current signal of said voltage-current converter circuit to develop a voltage signal which is a logarithm of said output current signal of said voltage-current converter circuit, and a transistor across whose base and emitter terminals is applied said voltage developed by said PN junction to produce a current signal which is an exponential of said voltage developed by said PN junction, thereby to effect a linear conversion between said output current signal of said voltage-current converter and said current signal produced by said transistor; and

means for controlling the ratio between magnitudes of said output current signal of said voltage-current converter and said current signal produced by said transistor.

4,288,708

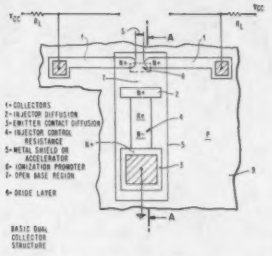
DIFFERENTIALLY MODULATED AVALANCHE AREA MAGNETICALLY SENSITIVE TRANSISTOR

Albert W. Vinal, Cary, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed May 1, 1980, Ser. No. 145,408

Int. Cl.³ H01L *29/82*

U.S. Cl. 307—309 **9 Claims**



1. A stabilized magnetically sensitive avalanche transistor having a base region of first conductivity type material and spaced emitter and collector regions of second conductivity type material forming respective PN junctions with said base region, said emitter and collector regions being connected to a source of electrical potential of proper polarity and magnitude to forward bias the emitter base junction and to reverse bias the collector base junction into avalanche generation of excess majority and minority carriers in said base region, said collector collecting said minority carriers, a region of second conductivity type forming an injector of minority carriers in said base region and a region of second conductivity type having a higher resistivity than said emitter region and said injector region extending from said emitter region to said injector region in the direction toward said collector region, said region of second conductivity type separating said emitter region from said injector region and from said base region only at a portion of said emitter base junction facing said collector base junction, there being at least two of said collector regions spaced apart from one another in said base material and approximately equidistant from said injector region, a localized impact ionization promotor means for facilitating the creation of an area of local covalent bond ruptures in the portion of the total area of said collector base junctions lying closest to said emitter, said promotor means affecting a portion of said area which is smaller than the total portion thereof lying closest to said emitter, said promotor means extending from said collector base junction area toward said emitter and serving to increase the local energy density in said smaller area to produce, upon supply to said area of said minority carriers from said injector, an abruptly conducting avalanche current generation of excess minority and majority carriers in an M factored multiplication process occurring at a characteristic voltage applied between said emitter and collector contacts.

4,288,709

HIGH PERFORMANCE STEPPER MOTOR

Dan W. Matthias, Downingtown, Pa., and Richard D. Thornton, Concord, Mass., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 809,646, Jun. 24, 1977, Pat. No. 4,198,582. This application Oct. 17, 1979, Ser. No. 85,614

Int. Cl.³ H02K *37/00*

U.S. Cl. 310—49 R **4 Claims**

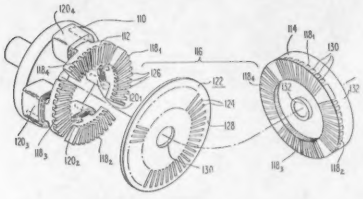
1. A high performance rotary stepper motor comprising:

stator means having an active and passive portion, each comprising a plurality of pole positions, each of said pole positions including a plurality of magnetic stator elements on opposite sides of an axial air gap with nonmagnetic

material located in the spaces between the extremities of said magnetic stator elements on each of said opposite sides of said air gap;

winding means associated with said active portion at said pole positions on only one side of said air gap for generating flux paths transverse to said air gap;

a rotor located within said air gap comprising a plurality of passive magnetic motive elements and nonmagnetic discontinuities including nonmagnetic material separating



said motive elements, said motive elements having extremities juxtaposed to the extremities of said stator elements so as to close said transverse flux paths through said motive elements, said motive means and said motive elements having configurations such that all of said motive elements are always confined to said air gap with magnetic force acting on said magnetic motive elements at both sides of said air gap, said rotor further comprising nonmagnetic discontinuities including said nonmagnetic material so as to eliminate any substantial longitudinal flux leakage.

4,288,710

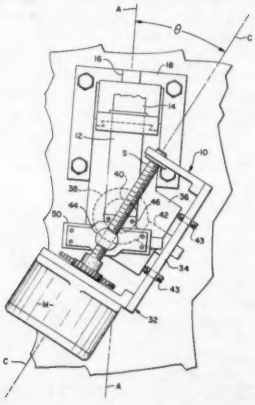
DRIVE MECHANISM

W. Duane Hamilton, Middletown, R.I., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 25, 1980, Ser. No. 124,193

Int. Cl.³ H02K *37/00*

U.S. Cl. 310—49 R **5 Claims**



1. Apparatus for driving an object along given path with a lead screw operated by a stepping motor wherein the improvement comprises:

a main support for said apparatus having a slideway and slide thereon, the latter carrying said object for movement along said given path;

a bracket supporting said lead screw and motor, said bracket being pivotally connected to said main support for selective angular adjustment of axial direction of said lead screw relative to said given path;

means pivotally interconnecting said slide and lead screw for moving said slide along said slideway with operation of said lead screw; and

means for selectively locking said bracket in various positions of said angular adjustment thereof.

4,288,711

ALTERNATOR-RECTIFIER CONSTRUCTION WHERE SHEET METAL DIODE SUPPORT PLATES SUPPORT A BEARING

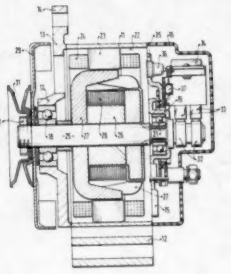
Walter Hagenlocher, Stuttgart; Heinz Hesse, Gerlingen; Karl Kleebaur, Allmersbach; Christoph Kugel, Stuttgart; Johann Künz, Sersheim; Werner Lemke, Bietigheim-Bissingen, and Rüdiger Söhnle, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 15, 1979, Ser. No. 85,111

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847501

Int. Cl.³ H02K *11/00*

U.S. Cl. 310—68 D **27 Claims**



1. Mobile alternator-rectifier combination construction, particularly for automotive vehicles, having

a frame structure (**11**);

a stator (**23, 24**) secured to the frame structure and having an armature winding (**24**);

a rotor (**26, 27, 28**) having a rotor shaft (**25**);

two bearings (**18, 21**) journaling the rotor;

an end cover (**13**) secured to one end of the frame and retaining one (**18**) of the two bearings, and extending transversely to the axis of rotation of the shaft;

and two groups of rectifier diodes (**36, 36'**) electrically connected to the armature winding,

and comprising, in accordance with the invention, two membrane-like disk-shaped sheet metal support plates (**15, 35**) positioned adjacent the axial end of the shaft remote from said end cover (**13**);

each support plate including

an essentially ring-shaped portion (**38**) surrounding the shaft and radially projecting fins (**39, 39'**) defining gaps therebetween;

at least one (**15**) of the disk-shaped support plates being secured to the frame and the other (**21**) of said two bearings (**18, 21**) being secured to the ring-shaped portion (**38**) of said at least one (**15**) of the support plates (**15, 35**);

one group of rectifier diodes (**36, 36'**), each, being secured to a respective support plate

whereby at least one support plate forms the support for the other bearing (**21**) and a heat sink and heat dissipation element for the diodes thereon;

electrically insulating means (**43, 43'**) interposed between said support plates;

and wherein the diodes (**36, 36'**) of the groups of rectifier diodes are secured on the projecting fins (**39, 39'**) of the disk-shaped sheet metal support plates (**15, 35**).

4,288,712

ALTERNATOR STRUCTURE FOR ASSEMBLY WITH A MOBILE INTERNAL COMBUSTION ENGINE, PARTICULARLY FOR AUTOMOTIVE USE

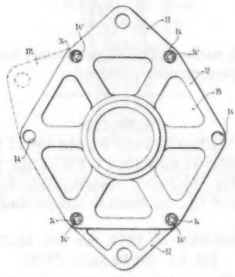
Walter Hagenlocher, Stuttgart; Heinz Hesse, Gerlingen; Karl Kleebaur, Allmersbach; Christoph Kugel, and Rüdiger Sohnle, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 15, 1979, Ser. No. 85,115

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1978, 2845667

Int. Cl.³ H02K *5/00*

U.S. Cl. 310—91 9 Claims



1. Alternator structure for assembly with a mobile internal combustion engine (E) particularly for automotive use having

a housing (**11**);

a stator (**15**, **23**) located and secured in the housing;

a rotor (**19**, **21**) having a shaft (**18**) journaled in bearings (**16**, **17**) positioned and secured in the housing;

and attachment means (**32**, **33**) to removably and adjustably attach the structure to the internal combustion engine,

wherein, in accordance with the invention,

the machine housing comprises a polygonal radially symmetrical tubular shell structure (**11**) and at least one end cover (**12**) of polygonal radially symmetrical plan outline matching the polygonal tubular housing shell structure in which at least one respective bearing (**16**) is secured;

the tubular shell structure includes an outwardly extending attachment projection or arm (**32**) in form of an elongated bushing extending parallel to the axis of the machine, to permit passage of an attachment bolt (**32***a*) therethrough for attachment to the internal combustion engine (E);

the at least one end cover (**12**) includes a radial locating projection (**33**) formed with an opening in the end portion thereof to permit passage of a locating or positioning clamping bolt (**33***a*)therethrough for attachment to the internal combustion engine (E) to fix the position of the alternator structure with respect to the internal combustion engine;

and attachment means (**34**, **34'**) removably and selectively angularly positionable to attach said at least one end cover (**12**) in predetermined selected angular orientation to the shell structure (**11**).

4,288,713

LAMP HAVING OPAQUE COATING

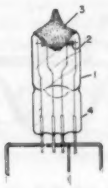
Richard C. Marlor, Beverly, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 23, 1979, Ser. No. 97,008

Int. Cl.³ H01K *1/32*

U.S. Cl. 313—117 6 Claims

1. In an incandescent lamp including at least one tungsten filament disposed within a glass envelope, the improvement comprising an opaque coating on a portion of the envelope for preventing transmission of light therethrough, the coating



comprising a dark mixture of manganese dioxide and aluminum phosphate.

4,288,714

SPARK PLUG FOR INTERNAL COMBUSTION ENGINE

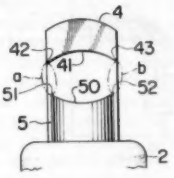
Shigeyasu Yamada; Kazumi Kawamura, and Shuji Nakamura, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 6, 1979, Ser. No. 45,888

Claims priority, application Japan, Oct. 16, 1978, 53/127603

Int. Cl.³ H01T *13/32*

U.S. Cl. 313—142 7 Claims



1. A spark plug for an internal combustion engine comprising an insulating body member, a center electrode extending from said body member and having a top surface, said top surface of said center electrode configured as a concave surface, an outer electrode having an inner surface facing said top surface, said outer electrode inner surface configured as a rounded concave surface opposing said top surface, said rounded concave surface having wedge-shaped edge projections forming spark gaps with the opposing center electrode top concave surface.

4,288,715

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

Johan B. J. van Overveld, Roosendaal; Auke G. van der Kooi, and Antonius J. A. van Stratum, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1979, Ser. No. 79,019

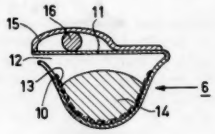
Claims priority, application Netherlands, Oct. 11, 1978, 7810213

Int. Cl.³ H01S *61/28*

U.S. Cl. 313—174 6 Claims

1. A low-pressure mercury vapor discharge lamp having a discharge vessel in which is located a container having an opening into the discharge vessel, the container containing a mercury amalgam for controlling the mercury vapor pressure in the discharge vessel, characterized in that the amalgam is secured to the inner surface of the wall of the container, said

container comprising a sheet metal plate formed to provide a receptacle in which the amalgam is present and a cover plate



which closes the receptacle except for a slit of not more than 0.2 mm wide between said cover plate and said receptacle.

4,288,716

ION SOURCE HAVING IMPROVED CATHODE

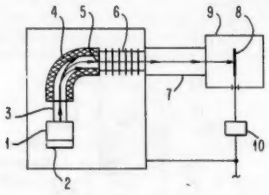
Holger Hinkel, Boeblingen, and Georg Kraus, Wildberg, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1979, Ser. No. 99,369

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855864

Int. Cl.³ H01J *27/00*

U.S. Cl. 313—230 **3 Claims**



1. An ion generator having a housing forming a chamber, means for supporting a cathode within the housing, means for establishing an electrostatic field between the cathode and the housing, positive and negative terminals for applying a DC voltage across opposite ends of the cathode to induce a heating current therein, and means for supplying a source of ionizable molecules into said chamber, wherein the improvement comprises:

the cathode having a region of reduced cross-section with respect to the cross-section of the remainder of the cathode, said reduced cross-section region being located nearer said negative terminal than said positive terminal.

4,288,717

THERMIONIC CATHODE APPARATUS

Hiroaki Tanji; Mitsuaki Saito, and Masaji Ishii, all of Machidashi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Machidashi, Japan

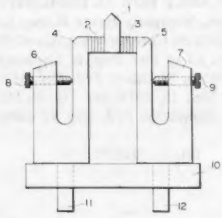
Filed Nov. 6, 1979, Ser. No. 91,860

Int. Cl.³ H01J *1/16, 19/10*

U.S. Cl. 313—336 **3 Claims**

1. A thermionic cathode comprising an electron emitting tip, tip supporting heaters made of a carbonaceous material arranged in contact with both sides of said tip, respectively, and supporting said tip, and elastic electroconductive members fixed to a base, said electroconductive members being arranged in pressure contact with the outer surfaces of said tip supporting heaters, and serving to supply an electric current thereto;

said tip supporting heaters being obtained by cutting said carbonaceous material, said carbonaceous material being obtained by hot-pressing a molding of synthetic resin that does not melt under heating, so as to form a pair of parallel planes perpendicular to the pressing direction, abrasion-polishing said parallel planes and then bringing the resulting smooth surfaces into close contact with said tip and said electroconductive members.



4,288,718

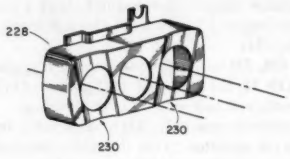
MEANS AND METHOD FOR BEAM SPOT DISTORTION COMPENSATION IN TV PICTURE TUBES

Allen P. Blacker, Hoffman Estates, and Arthur J. Ingle, Bartlett, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed May 24, 1979, Ser. No. 42,280

Int. Cl.³ H01J *9/14, 29/62*

U.S. Cl. 313—414 **17 Claims**



1. In a television cathode ray picture tube having at least one electron gun for generating at least one electron beam for projecting at least one beam spot on the picture imaging screen of said tube, said gun having a plurality of differently electrically charged electrodes having facing sections comprising juxtaposed walls with coaxially aligned openings therethrough for passage of said beam, said walls defining at least one gap in which is established a beam-focusing electrostatic field, said cathode ray tube being subject to influences which introduce an undesired distortion of said beam spot to the detriment of the quality of the image projected on said screen, said gun being characterized by at least one of said electrode walls being mechanically deformed in the perimeter of its opening to cause said field to be azimuthally asymmetrical about said opening, and effective to act on said beam in a sense tending to at least partially compensate for said undesired distortion of said beam spot.

4,288,719

CRT WITH MEANS FOR SUPPRESSING ARCING THEREIN

Karl G. Hernqvist, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

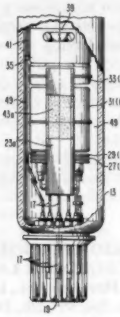
Filed Mar. 9, 1979, Ser. No. 18,907

Int. Cl.³ H01J *29/02, 29/46, 29/56*

U.S. Cl. 313—457 **9 Claims**

1. A cathode-ray tube comprising an evacuated envelope including an electrically-insulating neck, and an electron-gun mount assembly in said neck, said mount assembly comprising a plurality of electrodes mounted on at least two electrically-insulating support rods, said assembly being closely spaced from the inner surface of said neck, at least a portion of the

surface of each of said support rods facing a portion of said neck being electrically conducting each of said electrically conducting portions being opposite an electrode that partici-



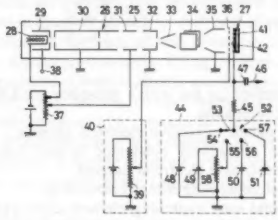
pates in focusing said electron beam, and having a resistivity of less than about 50,000 ohms per square and is electrically floating.

4,288,720

METHOD OF ERASING INFORMATION IN A SCAN CONVERTER STORAGE TUBE

Takefumi Kato, Hinode, and Haruo Abe, Hino, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1979, Ser. No. 82,144
Claims priority, application Japan, Oct. 9, 1978, 53-124376
Int. Cl.³ H01J *29/50, 31/00*
U.S. Cl. 315—13 ST **6 Claims**



1. In a scan converter storage tube of the type having an electron gun of an electrostatic focus and deflection variety for generating a modulated or unmodulated electron beam, the electron gun including a cathode and a field mesh electrode, and a storage target to be scanned by the electron beam from the electron gun, the storage target including a substrate fabricated from a single crystal of insulating material, the substrate having a storage surface which is disposed opposite to the field mesh electrode of the electron gun and which has formed thereon a collector electrode having a plurality of regularly patterned openings formed therein, a method of erasing information from the storage target which comprises:

(a) setting the potentials of the field mesh electrode and the collector electrode at such relative values that the potential (Vc) of the collector electrode is higher than the value which is lower than the potential (Vm) of the field mesh electrode by up to about 100 volts;

(b) causing the electron gun to scan the storage surface of the substrate with the unmodulated electron beam while the potentials (Vm, Vc) of the field mesh electrode and the collector electrode are set as in step (a);

(c) setting the potential (Vc) of the collector electrode higher than the potential (Vk) of the cathode and at such a value that the potential (Vs) of the storage surface with respect to the potential (Vk) of the cathode is made less than a first crossover potential (Vl) at which the secondary emission ratio of the substrate first becomes unity; and

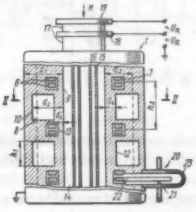
(d) causing the electron gun to scan the storage surface of the substrate with the unmodulated electron beam while the potential (Vc) of the collector electrode is set as in step (c).

4,288,721

MICROWAVE MAGNETRON-TYPE DEVICE

Jury I. Dodonov, Profsojuznaya ulitsa, 93, korpus 2, kv. 384, Moscow, U.S.S.R.

Filed Jun. 20, 1979, Ser. No. 50,553
Int. Cl.³ H01J *25/50*
U.S. Cl. 315—39.51 **5 Claims**



1. A magnetron comprising, an anode block comprising a multistage two-dimensional periodic retarding system and having a cylindrical central chamber, a cathode in said central chamber coaxial therewith, said anode block having a plurality of paired solid vanes disposed laterally spaced in a circumferential direction and extending inwardly of said chamber toward said cathode with the pairs thereof defining a plurality of resonator cavities, each vane having a root end and a free end terminating at said central chamber spaced outwardly from said cathode and having substantially flat sidewalls defining said resonator cavities, each cavity diverging from the free ends of the paired vanes toward the root ends thereof, each of said resonator cavities having a distributed inductance portion adjacent said root ends, said vanes having through windows on each stage of said retarding system, each of said through windows having a sidewall closer to the root end of a corresponding vane and an opposite sidewall closer to the free end of the corresponding vane, coaxial paired straps extending through the windows transversely of the vanes and each connected to a different group of alternate vanes, each of said vanes having an opening aligned with an opening of the adjacent vane to define a duct extending through all of the vanes in the vicinity of the distributed inductance portions thereof, and the magnetron having a frequency range including the long-wave range of the microwave frequency range greater than if the vanes did not have the aligned openings.

4,288,722

ELECTRONIC FLASH DEVICE

Kazuo Ikawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1979, Ser. No. 70,422
Claims priority, application Japan, Sep. 7, 1978, [illegible]-109975
Int. Cl.³ H05B *41/32*
U.S. Cl. 315—151 **12 Claims**

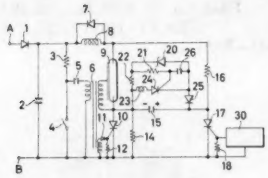
1. An electronic flash device comprising:

(a) flash tube means responsive to a discharge current for illuminating an object to be photographed to obtain a desired exposure level;

(b) main switching means connected in series with said flash tube means to form a discharge path for the discharge current when said main switching means is in a conductive state;

(c) subsidiary switching means coupled to said main switching means for rendering said main switching means non-conductive when the desired exposure level is obtained;

(d) a commutating capacitor connected between said flash tube means and said subsidiary switching means so that said commutating capacitor is charged in a forward direction through said main switching means when said subsidiary switching means is in a non-conductive state and said commutating capacitor is charged in the reverse direction through said subsidiary switching means when said subsidiary switching means is in a conductive state;



(e) a series circuit coupled across said commutating capacitor and including coil means and third switching means; and

(f) trigger means connected to said third switching means for applying a closing signal to close said third switching means to form a ringing circuit of said commutating capacitor and said series circuit after said subsidiary switching means is in the non-conductive state and said commutating capacitor has been charged in the reverse direction so that said commutating capacitor then discharges through said series circuit.

4,288,723

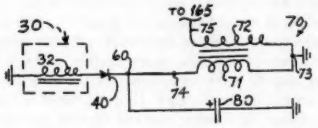
INDUCTIVE-CAPACITIVE CYCLIC CHARGE-DISCHARGE IGNITION SYSTEM

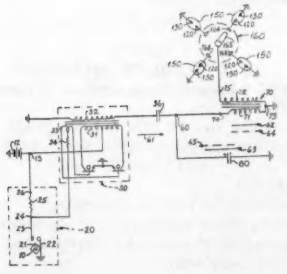
Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 35,013, May 1, 1979, abandoned. This application Jan. 16, 1980, Ser. No. 112,715

Int. Cl.³ H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—209 R **10 Claims**





1. An inductive-capacitive cyclic charge-discharge ignition system for providing a plurality of ignition periods, comprising the combination of:

an ignition transformer having a primary winding;

a capacitor connected to the primary winding and forming a parallel circuit with said primary winding;

a first diode in series with said parallel circuit;

AC generating means having an output winding in series with the first diode for powering said first diode and parallel circuit with AC energy during each said ignition period, said output winding, first diode and parallel circuit forming a switchless output network; and

timing means coupled to said AC generating means for controlling DC bias current to said generating means so as to duty cycle said generating means.

4,288,724

IMPULSE GENERATOR FOR USE WITH PHOSPHOR ENERGIZABLE LAMPS

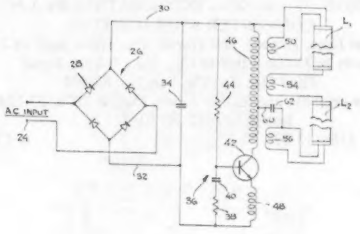
Eli H. Sherman, 12554 Havelock Ave., Los Angeles, Calif. 90066

Continuation of Ser. No. 857,220, Dec. 5, 1977, Pat. No. 4,129,805. This application Nov. 20, 1978, Ser. No. 961,976

The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.

Int. Cl.³ H05B *41/29*

U.S. Cl. 315—219 **42 Claims**



1. A generator for use with a phosphor excitable lamp, said generator comprising:

(a) input means to receive electrical current,

(b) means operatively connected to said input means for conducting said electrical current,

(c) a pulse generating means comprising:

(1) a solid state switching element connected to receive the electrical current,

(2) a primary inductive coil means connected to at least one terminal of said switching element,

(d) secondary coil means located to be coupled with said primary coil means, and developing a voltage therein substantially less than in the primary coil means,

(e) terminal means on said secondary coil means for connection to a phosphor excitable lamp,

(f) a first electrical current carrying conductor connected to one end of said primary coil means and being adapted for electrical connection to one terminal of said phosphor excitable lamp, and

(g) an intermediate tap on said primary coil means,

(h) a second electrical current carrying conductor connected to said intermediate tap on said primary coil means and being adapted for electrical connection to another terminal of said phosphor excitable lamp,

(i) a capacitive means in said second electrical current carrying conductor,

(j) said pulse generating means generating pulses in a sequence and at intervals sufficient to maintain energization of said lamp, said pulses being generated with relatively high peak rise on the leading edge of said pulses and a relatively gradual decay from said high peak for a greater portion of the pulse width of each of said pulses but which decay reaches a relatively sharp fall to a zero level at the

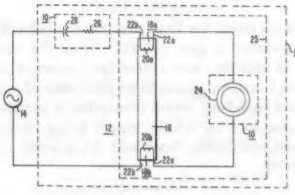
trailing edge of said pulses, such that the pulses are designed to maintain ignition and energization of the lamp with comparative current and voltage waveforms to achieve a power savings, and which pulses are transmitted from said primary coil means to said lamp through coupling of said lamp to said primary coil means.

4,288,725

LIGHTWEIGHT FLUORESCENT LAMP BALLAST

Edward W. Morton, Teaneck, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 26, 1979, Ser. No. 97,273
Int. Cl.³ H05B *41/18*
U.S. Cl. 315—245 **3 Claims**



1. A lightweight starting and operating ballasting means for starting and operating a fluorescent lamp means from a household source of AC energy, said fluorescent lamp means comprising an elongated tubular light-transmitting envelope having electrodes positioned therein proximate each end thereof, said electrodes each comprising an elongated tungsten coil having a lead-in member affixed to each end of each said coils and sealed through the ends of said envelope, said envelope enclosing a discharge-sustaining filling comprising mercury and a low pressure of inert ionizable starting gas, and a phosphor material layer carried on the interior surface of said envelope, said fluorescent lamp means having a normal operating voltage drop thereacross not exceeding about 65 volts, and said ballasting means having elements which perform with said lamp means in a starting mode and an operating mode as follows:

a. said ballasting means in said starting mode consisting of a closed electrically-conducting current-interrupting means connecting exteriorly of said lamp means to one of said lead-in members at each end of said lamp means to form with said electrode coils a series electrode-coil-preheat circuit, resistor means of predetermined value and capacitor means of predetermined value connecting in series circuit exteriorly of said lamp means with said series electrode-coil-preheat circuit to form a composite series circuit, and said composite series circuit adapted to be connected across the standard household source of AC energy intended for operating said lamp means; whereby on application of said household AC energy across said composite series circuit, said electrode coils are preheated and the atmosphere within said lamp means envelope is ionized; and

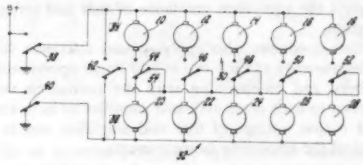
b. said ballasting means thereafter shifting to said operating mode by said current-interrupting means opening to open said electrode-coil-preheat series circuit, with the household source of AC energy then applied across said preheated coils to initiate and maintain a low pressure mercury discharge between said lamp electrodes, with the operation of said lamp means thereafter normally continuing as ballasted solely by said series-connected resistor means and capacitor means.

4,288,726

PERMANENT MAGNET MOTOR CONTROL SYSTEM

Alfonso Vazquez-Cuervo; Frederick T. Richards; Daniel V. Bafunno, all of Warren, and George Papacostas, Youngstown, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1980, Ser. No. 135,483
Int. Cl.³ H02P *1/54*
U.S. Cl. 318—54 **6 Claims**



4. A circuit for controlling a plurality of reversible electric motors comprising

a source of direct current potential,

first, second and third conductors,

first and second motor banks, each bank including a plurality of motors, one side of each motor in said first motor bank connected to said first conductor, one side of each motor in said second motor bank connected to said second conductor,

a plurality of independently operable select switch means for selectively connecting the other side of respective ones of said plurality of motors in said first or second banks to said third conductor,

bank selection switch means for connecting said third conductor to said first or second conductor,

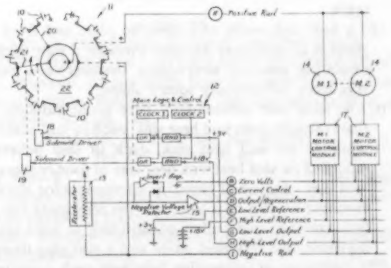
motor direction control switch means operable to connect said source across said first and second conductors in either of two polarity configurations.

4,288,727

MODULAR MOTOR AND CONTROL MEANS AND METHOD

Darryl R. Whitford, Bedford Park, Australia, assignor to The Flinders University of South Australia and The Minister of Transport, State of South Australia, both of Adelaide, Australia

Filed Sep. 6, 1978, Ser. No. 939,952
Claims priority, application Australia, Sep. 7, 1977, PD1537
Int. Cl.³ H02P *1/54*
U.S. Cl. 318—112 **8 Claims**



1. An arrangement of electric motors which are coupled together both mechanically and electrically,

comprising a reference voltage control potentiometer which controls a reference voltage,

each respective said motor having a separate power circuit and a separate control module comprising a series pass

element and a current sensing device in series with one another and with that said motor in the power circuit of that said motor, said series pass element having a control electrode, said current sensing device having an output voltage which is a correction voltage proportional to the motor current flow, a linear operational amplifier, and a conductor applying said correction voltage to said linear operational amplifier, isolator means connecting an output voltage of said linear operational amplifier to the control electrode of its respective said series pass element so as to control the equivalent resistance of that said series pass element,

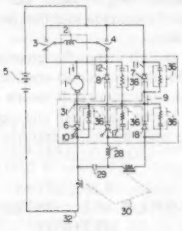
a further conductor also applying said reference voltage simultaneously to each one of said linear operational amplifiers, and co-operating with the correction voltage applied to each respective said amplifier so as to control said output voltage of that said amplifier, and in turn control the respective motor currents.

4,288,728

ELECTRIC VEHICLE CONTROL APPARATUS

Masayoshi Niimi, Toyota; Koshi Torii, Iwakura, and Hidetoshi Kato, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 27, 1979, Ser. No. 24,367
Claims priority, application Japan, Mar. 31, 1978, 53/38686
Int. Cl.³ B60L *11/18*
U.S. Cl. 318—139 **12 Claims**



1. An electric vehicle control apparatus, which includes at least a main thyristor for chopping a direct current flowing through an electric vehicle driving DC motor and a flywheel diode connected in parallel with said DC motor to form a path for conducting a flywheel current therethrough when said main thyristor is nonconductive, and which is fixed onto an electric vehicle body, comprising:

(A) a base member of said electric vehicle control apparatus fixed onto said vehicle body being in close contact therewith;

(B) a heat sink made of a metallic plate and fixed onto a portion of said base member through a thin sheet of an insulating material intervening therebetween, said heat sink has a substantially square shape;

(C) at least two substantially bare semiconductor pellets fixed directly onto said heat sink, each of said pellets being mounted on said heat sink, each of said pellets being mounted on said heat sink near one of four corners of said heat sink, and small capacity semiconductor devices are mounted on said heat sink near the remaining one of said four corners, said pellets constituting at least said main thyristor, said flywheel diode and a plugging diode;

(D) a plurality of connecting terminals each constituted by an L-shaped metallic bar which is mounted on one of said pellets and extends horizontally away from the pellet to which it is mounted and then bends upward leaving a suitable length of the horizontal portion thereof; and

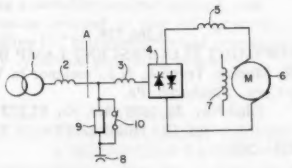
(E) at least one auxiliary electric device fixed onto said base member.

4,288,729

CONTROL SYSTEM FOR D.C. ELECTRIC MOTOR

Nobuo Anzai, and Eiki Watanabe, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1980, Ser. No. 130,684
Claims priority, application Japan, Mar. 19, 1979, 54/31984
Int. Cl.³ H02P *5/16*
U.S. Cl. 318—345 C **5 Claims**



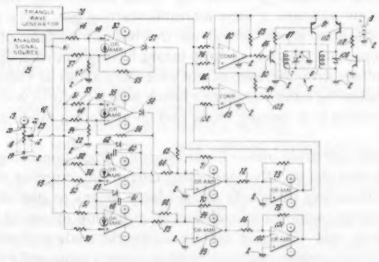
1. A control system for D.C. electric motors comprising: a thyristor converter; a gate control circuit for controlling a firing point of said thyristor converter; capacitor means connected through resistor means to an input side of said thyristor converter; and switching means connected in parallel with said resistor means, said switching means being opened after a predetermined time delay from said firing point of said thyristor converter.

4,288,730

PROPORTIONAL AND INTEGRAL SOLENOID ARMATURE POSITIONING CONTROL SYSTEM

Donald E. Graham, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 25, 1978, Ser. No. 945,086
Int. Cl.³ G05B *11/28*
U.S. Cl. 318—599 **3 Claims**



1. A proportional and integral solenoid armature positioning control system for effecting the adjustment of the armature of a solenoid into the solenoid armature position corresponding to each different input electrical signal representation of desired solenoid armature position comprising:

means for producing an electrical reference signal that is a function of the actual position of said solenoid armature;

first and second circuit means responsive to an input electrical signal representation of desired solenoid armature position and said reference signal for producing respective first and second mutually exclusive proportional error signals that are a function of the difference between the desired and actual solenoid armature positions in respective first and second relationships when the actual position of said solenoid armature does not correspond to the desired position as indicated by the input electrical signal representation of desired solenoid armature position;

third and fourth circuit means responsive to the said input electrical signal representation of desired solenoid arma-

ture position and said reference signal for producing respective first and second mutually exclusive integral error signals each of which corresponds to a respective one of said first and second proportional error signals;

means for summing each pair of corresponding said proportional and integral error signals; and

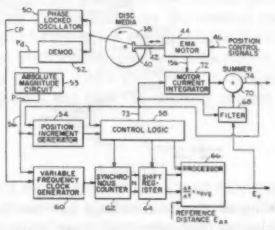
means responsive to the sum of said corresponding said proportional and integral error signals for effecting the adjustment of said solenoid armature into said desired solenoid armature position.

4,288,731

AVERAGE VALUE TACHOMETER FOR A DISC DRIVE SERVO AND THE LIKE

Patrick S. Lee, Campbell, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Feb. 22, 1980, Ser. No. 123,640
Int. Cl.³ G05B 5/01
U.S. Cl. 318—618 **8 Claims**



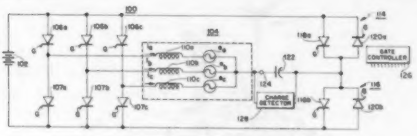
1. A tachometer for a disc pack servo system comprising means for generating a triangular position signal in response to radial movement of a servo head with respect to a prerecorded servo track, said position signal having ascending and descending linear portions each of which has a slope representative of the rate of radial movement of the servo head, means responsive to the linear portion of said position signal for producing at least first, second and third sampling pulses on attainment of said position signal of respective first, second and third voltage levels, the difference between said voltage levels being equal and representing equal increments of radial movement of said servo head, a counter having a reset input connected to said sampling pulse producing means, said counter having a counting input and being constructed and arranged to terminate counting of pulses supplied to said counting input in response to receipt of a sampling pulse at said reset input, a clock pulse source producing a series of regularly recurring clock pulses connected to said counting input so that said counter produces a number N at its output which is representative of the time between adjacent said sampling pulses, a digital to analog converter having a digital input to which N is connected, said converter having a capacity N_{limit}, a gain k and a reference voltage input and being constructed and arranged to produce an output equal to the product of k, (N/N_{limit}) and the voltage connected to said reference input, a difference circuit having a first input connected to said converter output and a second input to which a reference voltage is connected, said difference circuit being constructed and arranged to produce a voltage proportional to the difference between the voltage applied to said first and second inputs, and feedback means for feeding back to the reference voltage input of said converter the output of said difference circuit so that the voltage at a circuit point between the output of said difference circuit and the reference input of said converter is inversely proportional to N and is indicative of average radial speed of said servo head.

4,288,732

FORCED COMMUTATED STARTING CIRCUIT FOR LOAD COMMUTATED INVERTER DRIVE SYSTEM

James W. A. Wilson, and Robert L. Steigerwald, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,165
Int. Cl.³ H02P 1/46, 7/42
U.S. Cl. 318—723 **5 Claims**



1. In an inverter polyphase synchronous machine drive system including a polyphase synchronous machine excited from a source of direct current potential by an inverter, said inverter providing forced machine commutation for initial excitement thereof, said inverter comprising:

a plurality of pairs of serially-connected unidirectional conduction means corresponding in number to the number of machine phases, each pair of said conduction means connected across said source of direct current potential and coupled at the pair junction to a corresponding machine phase, respectively, each said conduction means controlling current therein in response to a gate control signal impressed thereon;

first and second controlled bidirectional conduction means serially connected across said source of direct current potential, each said controlled bidirectional conduction means conducting current in a direction determined by an external gate signal impressed thereon;

capacitor means connected between the junction of said first and second controlled bidirectional conduction means and the neutral terminal of said polyphase machine;

means for determining the charge of said capacitor; and

means for providing gate control signals to each of said unidirectional conduction means and each of said bidirectional current means to cause current to flow in a predetermined sequence through said machine phases with energy supplied by said capacitor, when said capacitor charge is above a predetermined value and for providing gate control signals to each of said unidirectional conduction means and each of said bidirectional current means to cause current to flow in said predetermined sequence through said machine phases and to charge said capacitor, with energy supplied by said source of DC potential when said capacitor charge is below a predetermined value.

4,288,733

BATTERY CHARGER SYSTEM AND METHOD ADAPTED FOR USE IN A STERILIZED ENVIRONMENT

Silvio G. Bilanceri, Owings Mills; Gary L. Kanner, Parkton, and Michael B. Uffer, Baltimore, all of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Oct. 17, 1979, Ser. No. 86,027
Int. Cl.³ H01M 10/44
U.S. Cl. 320—2 **18 Claims**

1. A battery charger system for use in a sterile environment such as an operating room, comprising:

a battery charger for electrical connection to at least one rechargeable battery;

an interface for operative connection between at least one rechargeable battery and said charger, said interface including a first connection means on one surface portion thereof for coupling with at least one rechargeable battery and a second connection means on another surface portion thereof for coupling with said charger and electrical inter-

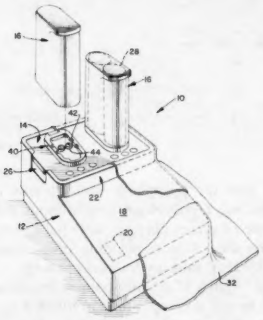
connection means for effecting electrical connection between said battery and battery charger; and

means for securing a sterilized drape between said interface and said charger.

10. A method of obtaining a charged sterile rechargeable battery, comprising the steps of:

discharging a rechargeable battery;

sterilizing said discharged battery;



mechanically and electrically connecting said sterilized, discharged battery to a sterilized interface;

mechanically and electrically connecting said sterilized interface to a battery charger, said interface effective to electrically interconnect said battery and said charger;

charging said battery by operation of said charger; and

disconnecting said sterile, charged battery from said interface.

4,288,734

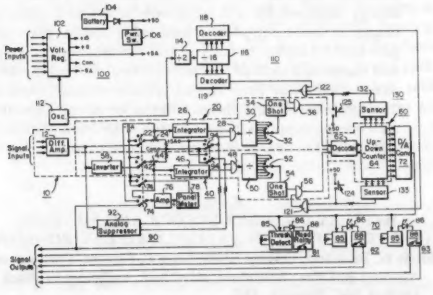
BIDIRECTIONAL INTEGRATOR

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mount Kisco, N.Y.

Filed May 25, 1979, Ser. No. 42,532

Int. Cl.[3] **H02J** *7/00;* **G01R** *11/00*

U.S. Cl. 320—48 **9 Claims**



1. A bidirectional integrator for integrating an electrical signal comprising:

first and second programmable pulse forming channels, each channel comprising means for forming a pulsed output signal having a pulse repetition rate which is a function of an input signal to said signal forming means, means for modifying said pulse repetition rate by a first factor selected from a continuous range of factors and a programmable circuit for multiplying and/or dividing said pulse repetition rate by a second factor selected from a plurality of discrete factors;

a bidirectional counter which is driven in one direction by the pulsed output signal from the programmable circuit of the first channel and in the opposite direction by the pulsed output signal from the programmable circuit of the second channel;

means for controlling the direction in which said bidirectional counter is driven; and

means for producing an output signal from said bidirectional counter.

4,288,735

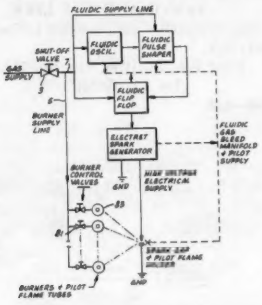
VIBRATING ELECTRET REED VOLTAGE GENERATOR

Roger C. Crites, Florissant, Mo., assignor to McDonnell Douglas Corp., Long Beach, Calif.

Filed Sep. 17, 1979, Ser. No. 75,881

Int. Cl.[3] **F23Q** *3/01*

U.S. Cl. 322—2 A **10 Claims**



1. A vibrating electret reed voltage generator, comprising:

a flexible electret reed supported at one distal end and having first and second opposing major surfaces;

a high voltage electrode formed by coating said first major surface of said electret reed with a thin conductive coating;

a ground electrode spaced opposite said second major surface of said electret reed so that said second major surface contacts said ground electrode at full amplitude of the vibratory excursion of said electret reed;

a high voltage terminal connected to said high voltage electrode;

a ground terminal connected to said ground electrode; and

means to vibrate said electret reed whereby electrical power is produced with each vibratory cycle of said electret reed.

6. The vibrating electret reed voltage generator as recited in claim **1**, wherein said means to vibrate said electret reed is a fluid controlled by a fluidic oscillator circuit.

4,288,736

CONTROL SYSTEMS FOR ELECTRIC GENERATORS

Michael J. Wright, Stamford, England, assignor to Newage Engineers Limited, Stamford, England

Filed Apr. 10, 1979, Ser. No. 28,698

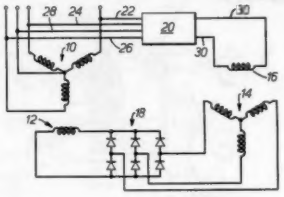
Claims priority, application United Kingdom, Apr. 12, 1978, 14359/78

Int. Cl.[3] **H02P** *9/10;* **H02G** *9/30*

U.S. Cl. 322—28 **15 Claims**

1. In a control system including a thyristor for controlling a generator having an excitation winding by which the excitation of the generator is produced or controlled, the excitation winding being connected, through the thyristor forming part of the control system, to at least one alternating current output terminal of the generator, the output terminal or terminals to which the excitation winding is connected together providing a waveform which is interrupted or changes polarity during each cycle of the waveform, thereby allowing the thyristor to turn off, the control system also including firing means ar-

ranged to fire the thyristor at a moment during the waveform which varies with variations in the required excitation, and a starting excitation current path leading from an output terminal or terminals of the generator to the excitation winding, which path includes means arranged to limit the current in the path to a value which is greater than the latching current of the thyristor, the improvement comprising protection means which includes a bistable device arranged to be switched from



its normal state by a fault or overload condition to a disabling state in which it disables the excitation of the generator, including disabling of the starting excitation current path, and to be maintained in its disabling state by the residual output of the generator until the speed of the generator is reduced to a resetting value, with a corresponding reduction in the generator output to a value at which the current in the starting excitation current path is less than the latching current of the thyristor.

4,288,737

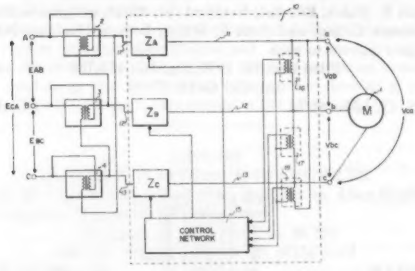
REGULATOR-COMPENSATOR CONTROL

James E. McClain, and Howard L. Scott, both of Greenville, Tex., assignors to Esco Manufacturing Company, Dallas, Tex.

Filed May 21, 1979, Ser. No. 40,857

Int. Cl.³ G05F *1/34*

U.S. Cl. 323—254 **5 Claims**



1. In a system for supplying power to a load from a polyphase source, the improvement comprising a regulator-compensator control interconnected between the source input terminals and the load input terminals, said regulator-compensator control comprising:

means for independently sensing the respective voltages across the load input terminals;

a feedback control network coupled to said voltage sensing means for generating a separate and independent control signal in response to each sensed terminal voltage; and

a control signal responsive, variable impedance element connected in series circuit relation between said source input terminals and said load input terminals, each variable impedance element being connected to said feedback control network to receive the corresponding independent control signal, with the impedance of each variable impedance element changing in response to a change in the associated control signal to selectively alter the voltage drops in each of the supply lines.

4,288,738

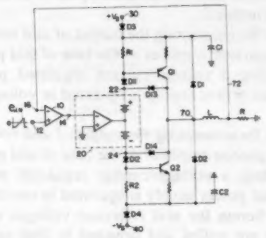
DUAL-MODE AMPLIFIER

Jerrold J. Rogers, and John Durecka, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 3, 1980, Ser. No. 137,039

Int. Cl.³ H03K *17/64*

U.S. Cl. 323—271 **8 Claims**



1. A circuit for controlling current flow through an inductance comprising:

(a) an inductance;

(b) means for receiving a variable input signal;

(c) amplifier means for producing in said inductance a controlled current representative of said input signal, said amplifier means being capable of operation in either a linear mode or a non-linear mode; and

(d) means responsive solely to the rate of change of said variable input signal for coupling a capacitance in parallel resonant connection with said inductance whenever said input signal changes at a rate greater than a predetermined design rate, thereby causing said amplifier means to switch from said linear mode to said non-linear mode.

4,288,739

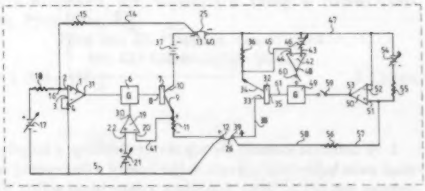
DYNAMIC LOAD FOR TESTING REGULATED POWER SUPPLIES

Sarkis Nercessian, Flushing, N.Y., assignor to Kepco, Inc., Flushing, N.Y.

Filed Mar. 10, 1980, Ser. No. 128,850

Int. Cl.³ G01R *21/00*

U.S. Cl. 323—275 **4 Claims**



1. In an electronic load for loading a voltage/current regulated power supply, the combination of;

a pair of terminals for connecting to a voltage/current regulated power supply one of said terminals being designated negative, to be connected to the negative terminal of said power supply and the other being designated positive, to be connected to the positive terminal of said power supply;

a pass transistor and current sensing resistor connected in series across said terminals with the collector of said transistor connected to said positive terminal, the emitter of

said transistor connected to one end of said resistor and the other end of said resistor connected to said negative terminal;

a current regulating circuit including a comparison amplifier and a source of adjustable reference voltage connected across said current sensing resistor;

a voltage regulating circuit including a comparison amplifier, a source of adjustable reference voltage and a feedback path including a series resistor wherein said amplifier and reference voltage returns are connected to said negative terminal and said feedback path is connected to said positive terminal;

and means for connecting the output of said current regulating comparison amplifier to the base of said pass transistor for loading a voltage/current regulated power supply when said power supply is operated in voltage regulating mode,

and means for connecting the output of said voltage regulating comparison amplifier to the base of said pass transistor for loading a voltage/current regulated power supply when said power supply is operated in current regulating mode wherein the said reference voltages and feedback resistors are polled and oriented so that said electronic load acts as a voltage/current sink to a voltage/current regulated power supply connected to said terminals.

4,288,740

CONSTANT CURRENT SWITCH

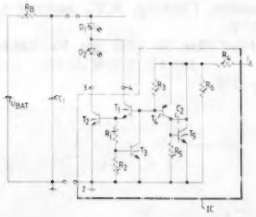
Karl-Diether Nutz, Oedheim, and Helmut Moser, Heilbronn, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Aug. 31, 1979, Ser. No. 71,477

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838171

Int. Cl.³ G05F *5/00*

U.S. Cl. 323—303 **4 Claims**



1. A constant current switch for controlling a largely constant switchable load current in the case of a fluctuating supply voltage subject to large decreases, comprising: a first bipolar transistor connected into the current branch of the load current; a voltage divider for measuring the control voltage at said first transistor connected in parallel with the base-emitter path of said first transistor; a second bipolar transistor in connection with a control input of the circuit and having its base electrode connected to said voltage divider; and a third bipolar transistor connected between the collector electrode of said second transistor and the base electrode of said first transistor, with the collector electrode of said second transistor connected to the base electrode of said third transistor and the emitter electrode of said third transistor connected to said voltage divider and to the base electrode of said first transistor.

4,288,741

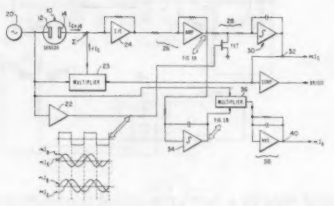
ELECTRICAL MEASUREMENT OF FLUID VOID FRACTION FOR FLUID HAVING CAPACITIVE AND RESISTIVE CONDUCTIVE COMPONENTS

Ronald L. Dechene, Boxford, and Robert E. Newton, Tewksbury, both of Mass., assignors to Auburn International, Inc., Danvers, Mass.

Filed May 18, 1979, Ser. No. 40,326

Int. Cl.³ G01R *27/26*

U.S. Cl. 324—61 R **4 Claims**



1. Method of measuring a liquid content of mixed phase fluid in a container wherein a conductive liquid contains voids therein comprising:

making a capacitive current measurement between two spaced (in cross-section of the fluid container) electrodes,

and cancelling out a conductive (electrically) component of the current measurement through the fluid inherently picked up in making the capacitive measurement so that the capacitive measurement is not masked by the conductive measurement and wherein the measured current is produced by application of an oscillating voltage to the electrodes and the output capacitive current component (or a voltage derivative thereof) is shifted into phase with the oscillating voltage.

4,288,742

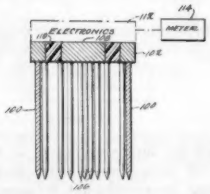
ELECTRICAL MOISTURE SENSOR

John E. Walsh, Box 264, Bradford, Vt. 05033, assignor to Dartmouth College and John E. Walsh, both of Hanover, N.H., part interest to each

Filed Dec. 18, 1979, Ser. No. 104,738

Int. Cl.³ G01R *27/26*

U.S. Cl. 324—61 R **4 Claims**



1. A moisture sensor comprising:

a base,

a first ring of spines extending outwardly from said base in parallel;

a second ring of spines extending outwardly from said base in parallel within said first ring, separated and electrically insulated therefrom, said spines being sufficient in number to appear as a ground plane forming an effective coaxial capacitor and being insertable into material to be sensed; and

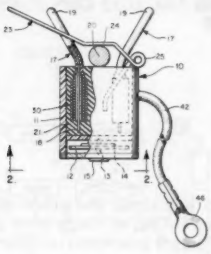
circuit means connected to said first and second rings for applying an ac signal to said spines measuring the impedance of said material between said rings.

4,288,743

FAULT INDICATOR OPERABLE FROM A REMOTE EXCITATION SOURCE THROUGH A UNIFORMLY DISTRIBUTED IMPEDANCE CABLE

Edmund O. Schweitzer, 1002 Dundee Rd., Northbrook, Ill. 60118

Filed Oct. 10, 1978, Ser. No. 949,656
Int. Cl.³ G01R *19/165, 31/02;* **H02H** *9/00;* **H01C** *7/00*
U.S. Cl. 324—127 **17 Claims**



15. In a fault indicator operable from a remote low-voltage excitation source for indicating the presence of a fault current in a relatively high-voltage electrical conductor, said indicator including a housing, and externally-viewable circuit condition indicating means within said housing having a fault-indicating state and a reset-indicating state, said indicating means being operable from an applied excitation current, the improvement comprising;

means comprising a flexible cable extending between said indicating means and said external excitation source for supplying excitation to said indicating means, said cable including;

an electrically conductive core portion forming an electrical path having a uniformly distributed impedance many times greater than that of said electrical conductor and said excitation source between said indicating means at one end and said source at the other end, whereby said core portion, if shorted to ground, results in only an inappreciable current flow from either said electrical conductor or said excitation source; and

an electrically insulating sleeve portion extending around and along said core portion between said housing at one end and said excitation source at the other end.

4,288,744

SUMMING WATT-HOUR TRANSDUCER

John E. Callan, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Jul. 19, 1979, Ser. No. 58,752
Int. Cl.³ G01R *21/06, 19/16;* **H02J** *3/14*
U.S. Cl. 324—142 **10 Claims**

1. A summing transducer for summing the energy consumption of a first load, which is connected to a plurality of power supply lines, and the energy consumption that is measured for a second load by an energy-monitoring device that generates an energy demand signal, the transducer comprising:

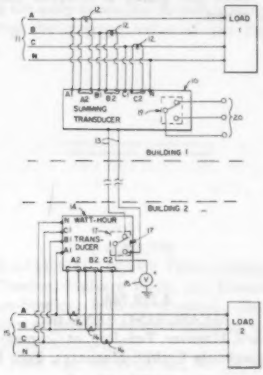
power transducer means, coupled to the power supply lines, for generating a signal proportional to the instantaneous power being supplied to the first load;

summing integrator means having two inputs and an output, one input being coupled to the power transducer means to receive the signal proportional to the instantaneous power supplied to the first load, and the other input being connected to receive a signal derived from the energy demand signal provided by the energy-monitoring device, the summing integrator means being responsive to the received signals for generating an output signal proportional to a unit of energy consumption for the two loads;

control means adapted to be coupled to the energy-monitoring device, and responsive to the energy demand signal from the energy-monitoring device to generate a control signal;

a capacitor;

switch means connected between a voltage supply and the capacitor and connected between the capacitor and the second input on the summing integrator means for initially coupling the capacitor to the voltage supply to charge the capacitor to a value proportional to a unit of energy demand for the second load, the switch means being coupled to the control means and being responsive to the control signal therefrom to electrically couple the charged capacitor to the second input of the summing integrator means; and



unit measuring means coupled to the output of the summing integrator means and responsive to the output signal therefrom for generating a signal representing the consumption of a preselected unit of energy by the two loads,

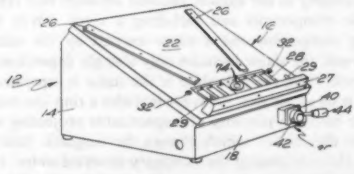
whereby the discharge of the capacitor in response to its coupling to the second input on the summing integrator means provides a signal that can be summed and integrated with the signal from the power transducer means to generate the signal proportional to a unit of energy consumption for the two loads.

4,288,745

PRINTED CIRCUIT BOARD TESTING MEANS

James E. Plante, Attleboro, Mass., and Warren E. Pfeifer, North Kingstown, R.I., assignors to Ostby & Barton Company, Providence, R.I.

Filed Jul. 22, 1980, Ser. No. 171,093
Int. Cl.³ G01R *31/02, 15/12*
U.S. Cl. 324—158 F **5 Claims**



1. A printed circuit board testing means, comprising in combination:

a housing having an essentially rectangularly-shaped, truncated, box-like structure, having a forward sloping upper surface with a platen means secured thereto;

a test head interface assembly adapted to be received on said platen;

said platen having at least a pair of guide rails in a V-shaped configuration on the surface thereof;

said test head assembly having a plurality of guide rails to engage the platen rails and align the test head assembly on said platen;

a means for elevating and lowering said platen;

electrical connecting means incorporated in said housing and said test head interface assembly, said guide rails on said platen and said housing positioned to direct the test head assembly to a predetermined location on the platen, whereby when the platen is lowered the connecting means are mated.

4,288,746

MEASURING SENSOR

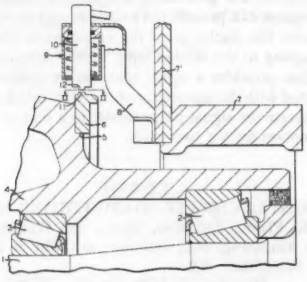
Günther Singbartl, Hanover, Fed. Rep. of Germany, assignor to Wabco Westinghouse GmbH, Hannover, Fed. Rep. of Germany

Filed Oct. 23, 1978, Ser. No. 953,529

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1977, 2755379

Int. Cl.³ G01P *3/48*

U.S. Cl. 324—174 **6 Claims**



1. A speed measuring sensor for producing an output signal corresponding to the angular rotation between two relatively movable components and including a rotor driven by the rotating component and a stator carried by the stationary component, the stator includes only a single dependent cylindrical pole shoe, the pole shoe of the stator is separated from the rotor by an air gap, the rotor includes a ring-like magnetic member having a plurality of magnetizable projecting sectors of equal dimensions which change the magnetic field while passing the pole shoe of the stationary mounted stator, characterized in that the surface area of each of the plurality of the magnetizable sectors of the rotor and the surface area of the pole shoe of the stator exhibit a maximum ratio of 1 to 1 and in that the maximum cross sectional dimension of each of the magnetizable sectors of the rotor is equal to the maximum distance between two adjacent magnetizable sectors of the rotor so that spurious noise signals are minimized.

4,288,747

SELF-SCANNING APPARATUS HAVING IMPROVED MEASURING RANGE FOR MEASURING CONTOUR OF A METALLIC BODY

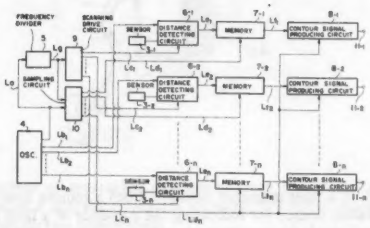
Shigeo Kawabata, Tokyo, and Norihisa Inazaki, Yokohama, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1979, Ser. No. 31,337

Claims priority, application Japan, Apr. 27, 1978, 53-55258[U]

Int. Cl.³ G01B *7/04, 33/12;* **G01N** *27/82;* **H03K** *5/00*

U.S. Cl. 324—207 **3 Claims**



1. In a contour measuring apparatus, comprising eddy-current distance measuring means for measuring a contour of a conductive object, said eddy-current distance measuring means including a plurality of detection sensors arranged in a row along a predetermined reference line which provides measuring reference positions with respect to said conductive object to be measured so that the distance between each of said detection sensors and a surface of said conductive object is detected to measure said contour of said conductive object, each of said detection sensors including a detection coil, said eddy-current distance measuring means further including an oscillator for energizing each of said detection coils with a reference alternating signal having a predetermined frequency and amplitude, and a distance detecting circuit for detecting a change in the impedance of each of said detection coils varying in accordance with the distance between each said detection coil and said conductive object due to a mutual inductive action therebetween; the improvement comprising:

scanning means for energizing said detection sensors sequentially one at a time and in accordance with a unit scanning period corresponding to plural times the period of said reference alternating signal;

memory means for receiving measurement signals corresponding to distances sequentially measured by said detection sensors at said unit scanning period, said measurement signals being received sequentially from said distance detecting circuit and stored temporarily for a time duration in which a cycle of the scanning of all said detection sensors is completed;

contour signal producing means for reading a stored content of said memory means and generating a corresponding contour signal each time said cycle of scanning is completed; and

sampling means for providing an update signal to said memory means in accordance with energization of each of said detection sensors at said unit scanning period, said memory means being responsive to said update signal for updating its stored content with a measurement signal from said energized detection sensor after a predetermined delay time with respect to the time of beginning of the energization thereof.

4,288,748

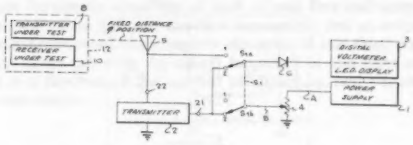
METHOD FOR TESTING METAL DETECTORS

Robert M. Kaye, 1309 S. Columbus St., Arlington, Va. 22204; Gary A. Eiloo, 9089 Brook Ford Rd., Burke, Va. 22015, and Thomas Tucker, 1740 Tucker Rd., Oxon Hill, Md. 20022

Division of Ser. No. 718,345, Aug. 27, 1976, Pat. No. 4,144,486. This application Aug. 7, 1978, Ser. No. 931,938

Int. Cl.[3] **G01V** *3/12;* **G01R** *35/00*

U.S. Cl. 324—326 **1 Claim**



1. A method for testing low power, low frequency devices used for locating metal objects or the like and equipped with, at least, a radio receiver, comprising the steps of:

selectively supplying variable voltage power to an input of voltage measuring means and to a power input connection of a low power, low frequency radio frequency transmitter unit for transmitting to said receiver,

placing said receiver at a predetermined fixed location at a constant distance and orientation with respect to the antenna of said radio transmitter,

tuning said receiver to receive the signal radiated from said radio transmitter,

measuring an output voltage produced by the received signal at said receiver,

adjusting the voltage of said supplied power to said transmitter to a predetermined value,

decreasing the variable voltage of said supplied power until a minimum acceptable voltage output is obtained from the receiver and

comparing the measurements of said supplied variable voltage corresponding to a minimum acceptable output from the receiver at which the receiver is functional with a predetermined value indicative of a properly functioning receiver whereby the receiver is determined to be operative or nonoperative.

4,288,749

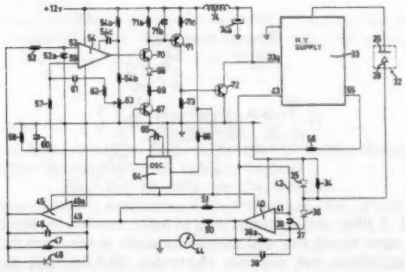
METHOD AND APPARATUS FOR MEASURING OXYGEN CONCENTRATION

Fernand R. C. Murtin, Paris, France, assignor to Generale de Fluide, Paris, France

Filed Apr. 26, 1979, Ser. No. 33,500

Int. Cl.[3] **G01N** *27/00*

U.S. Cl. 324—464 **11 Claims**



1. Apparatus for measuring the oxygen concentration in a gas comprising:

an ionization-probe comprising an ionization cell having a substantially flat electrode and a pointed electrode disposed substantially perpendicular to said flat electrode at a short distance therefrom;

a high voltage DC source connected to said flat electrode for providing current to said flat electrode at a voltage sufficiently high to generate successive electric discharges between said electrodes at substantially atmospheric pressure;

regulating means for holding substantially constant the ratio of the voltage of said DC source to the current in said pointed electrode as oxygen concentration varies; and

processing circuitry connected to said pointed electrode for measuring the average value of the current flowing therein.

4,288,750

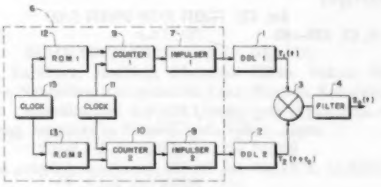
SURFACE ACOUSTIC WAVE TIME CHIRP DEVICES

Cleland O. Newton, Malvern Wells, and Edward G. S. Paige, Horton-com-Studley, both of England, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 30, 1979, Ser. No. 34,540

Int. Cl.[3] **H03K** *3/00*

U.S. Cl. 328—158 **16 Claims**



1. A surface acoustic wave device comprising: first and second surface acoustic wave dispersive delay lines having input and output connections; first and second pulse means for applying respective input pulses to said delay lines input connections, said pulse means including means for varying the relative time delay between said respective input pulses to said delay lines; and mixer means for mixing together the outputs of said delay lines.

4,288,751

WAVE TRANSLATING CIRCUIT

Ikio Yoshida; Kouzou Kage; Kazuhiro Ikeda, and Yasuo Sato, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 22,648

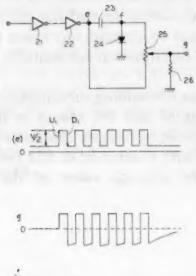
Claims priority, application Japan, Mar. 24, 1978, 53/34320; Mar. 24, 1978, 53/115329

Int. Cl.[3] **H03K** *5/08;* **H04N** *5/16*

U.S. Cl. 328—173 **3 Claims**

1. A wave translating circuit comprising capacitor means

supplied with an input signal; limiter means for limiting the output of said capacitor means; and adder circuit means for



adding the output of said limiter means to said input signal to produce an output signal from said wave translating circuit.

4,288,752

STEREO DEMODULATOR WITH HIGH FREQUENCY DE-EMPHASIS COMPENSATION

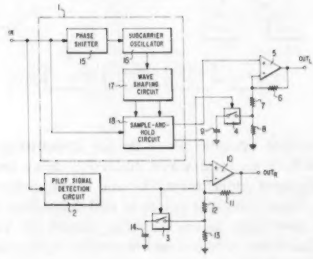
Atsushi Ogawa, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1979, Ser. No. 74,824

Claims priority, application Japan, Sep. 18, 1978, 53-127772[U]

Int. Cl.³ H03D 3/18; H04H 5/00

U.S. Cl. 329—50 **2 Claims**



1. In a stereodemodulator for demodulating a composite stereo signal including a sample-and-hold stereo multiplex demodulator having (a) an oscillator, the output of which is phase synchronous with and double in frequency that of a pilot signal in said composite stereo signal and (b) circuitry for deriving from the oscillator output signal, a pair of oppositely phased, low duty ratio sample pulses for sampling said composite stereo signal to obtain left and right signals therefrom, the improvement comprising

pilot signal detecting means for detecting the presence of said pilot signal in said composite stereo signal; and

a pair of frequency sensitive amplifiers respectively responsive to said left and right signals, said amplifiers including control means for varying the respective high-frequency characteristics thereof, said control means being responsive to said pilot signal detecting means to emphasize the high-frequency characteristics of said pair of amplifiers to thereby compensate for de-emphasis of the high frequency range of the right and left signals caused by said sample-and-hold stereo multiplex demodulator.

4,288,753

MUTING CIRCUIT WITH OPERATIONAL AMPLIFIER

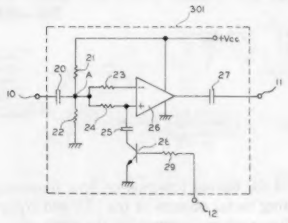
Sotoaki Babano, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Aug. 29, 1979, Ser. No. 70,673

Claims priority, application Japan, Sep. 12, 1978, 53-125968

Int. Cl.³ H03G 3/24

U.S. Cl. 330—51 **13 Claims**



9. An FM muting circuit comprising a common input terminal, operational amplifier means having a pair of input terminals coupled to the common input terminal of the muting circuit, electronic switching means connected between ground and one of the operational amplifier input terminals, control means responsive to input signals at said common input terminal when said input signals are free of noise for developing a high-level control signal which switches the electronic switching means to a condition which grounds one of the operational amplifier input terminals, whereby the operational amplifier amplifies only the signal applied from the common input terminal of said muting circuit to the other input terminal of said amplifier means, said control means responsive to noise appearing in the input signal at said common terminal for developing a low-level control signal which switches the electronic switch to a condition which enables the signal appearing at the common input terminal of said muting circuit to appear in phase at both amplifier input terminals to cause a cancellation of an output signal from said operational amplifier, thereby effectively rejecting the signal containing noise, and means at the two input terminals of the operational amplifier for preventing any substantial change of bias potential thereat responsive to switching operations of the muting circuit.

4,288,754

FILTER CIRCUIT

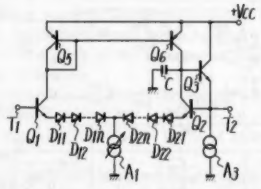
Takashi Okada, Yokohama, and Yasunobu Kuniyoshi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 24, 1979, Ser. No. 78,205

Claims priority, application Japan, Sep. 26, 1978, 53-118248

Int. Cl.³ H03F 3/45

U.S. Cl. 330—260 **8 Claims**



1. A filter circuit, comprising an input terminal for receiving an input signal; first and second transistor means, each having base, emitter and collector electrodes, said first and second transistor means being connected in differential amplifier configuration and having their emitter electrodes connected to a common connection; variable current source means connected to said common connection; said input terminal being con-

nected to the base electrode of said first transistor means; a source of reference potential; reactance means coupled between the collector electrode of said second transistor means and said source of reference potential; third transistor means having base, emitter and collector electrodes, the base electrode of said third transistor means being connected to the collector electrode of said second transistor means and the emitter electrode of said third transistor means being connected to the base electrode of said second transistor means; an additional current source connected to the emitter electrode of said third transistor means; resistance means connected between the emitter electrode of each of said first and second transistor means and said common connection; and an output terminal connected to the emitter electrode of said third transistor means, whereby the cut-off frequency of said filter circuit is a function of the current produced by said variable current source.

4,288,755

PROTECTIVE CIRCUIT FOR A DIRECT-COUPLED AMPLIFIER

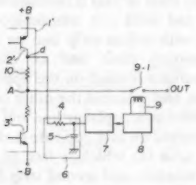
Kazumasa Sakai, Tokyo, Japan, assignor to TRIO Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1979, Ser. No. 64,434

Claims priority, application Japan, Aug. 18, 1978, 53-113365[U]

Int. Cl.³ H02N *7/20*; H03F *3/04, 21/06*

U.S. Cl. 330—298 **6 Claims**



1. A protective circuit for a direct-coupled amplifier and for a load device connected to said direct-coupled amplifier, said direct-coupled amplifier comprising:

a positive and a negative power sources;

two output transistors connected to said positive and negative power sources, respectively;

series-connected two resistors defining an intermediate point therebetween at which substantially zero voltage prevails when said direct-coupled amplifier is functioning normally, and being interposed between said two output transistors; and

an output terminal interconnecting said intermediate point and said load device;

said protective circuit comprising:

a low pass filter connected to the junction between one of said output transistors and said series connected two resistors; and

means connected to said low pass filter for isolating said intermediate point from said output terminal in response to the output of said low pass filter.

4,288,756

CO_2 LASER

Alan S. Kaye, Wantage, England, assignor to United Kingdom Atomic Energy Authority, London, England

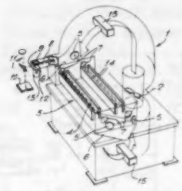
Filed Jun. 13, 1978, Ser. No. 915,284

Claims priority, application United Kingdom, Jun. 17, 1977, 25510/77

Int. Cl.³ H01S *3/02*

U.S. Cl. 331—94.5 G **10 Claims**

1. A transverse flow gas discharge laser comprising, a closed system of ducting including a region of rectangular cross-section, means for forming an optical resonant cavity including said region, means for abstracting energy from said optical resonant cavity, means for circulating a gaseous lasing medium unidirectionally through the system of ducting, a cathode electrode situated adjacent to and spaced from one wall of the said region of ducting and extending parallel thereto, the cathode electrode also extending transversely of the direction of flow of the lasing medium and parallel to the optic axis of the optical cavity, an anode electrode at the other side of the said region of ducting opposite the cathode electrode and extending



parallel thereto, the cathode electrode having a non-circular cross-section and being mounted such that the lasing medium surrounds the cathode electrode, the separation between the cathode electrode and the adjacent wall of the said region of ducting being such that, in use, distortions in the flow of the flowing lasing medium in the neighborhood of the adjacent wall of the said region of ducting interact with the cathode electrode to stabilize a cathode flare which forms in operation of the laser and hence to stabilize an associated electric discharge between the electrodes.

4,288,757

SEMICONDUCTOR LASER DEVICE

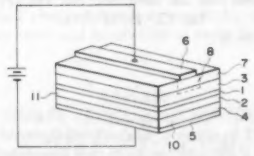
Takashi Kajimura, Hachioji; Motohisa Hirao, Tokyo; Michiharu Nakamura, Hinodemachi; Takao Kuroda, Kokubunji; Shigeo Yamashita, and Jun-Ichi Umeda, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 10, 1979, Ser. No. 56,360

Claims priority, application Japan, Jul. 10, 1978, 53-83014

Int. Cl.³ H01S *3/19*

U.S. Cl. 331—94.5 H **6 Claims**

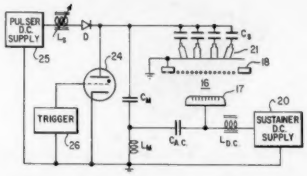


1. In a semiconductor laser device comprising a semiconductor substrate composed of $GaAs_tP_{1-t}$ ($0.54 \leqq t < 1.0$), a first semiconductor layer of a first conducting type formed on the substrate and composed of $Ga_pAl_{1-p}As_qP_{1-q}$ ($0 \leqq p \leqq 0.91$ and $0.47 \leqq q \leqq 1.0$), a second semiconductor layer formed on said first semiconductor layer and composed of $Ga_yIn_{1-y}As_xP_{1-x}$ ($0.52 \leqq y \leqq 1.0$ and $0 \leqq x \leqq 1.0$), a third semiconductor layer of a conducting type reverse to that of the first semiconductor layer, which is formed on said second semiconductor layer and is composed of $Ga_{p'}Al_{1-p'}As_{q'}P_{1-q'}$ ($0 \leqq p' \leqq 0.91$ and $0.47 \leqq q' \leqq 1.0$), said second semiconductor layer containing at least one optical confinement region having a higher refractivity than those of the first and third semiconductor and a band gap smaller than those of the first and third semiconductor layers.

4,288,758
HIGH POWER LASER AND CATHODE STRUCTURE THEREOF

Herb J. J. Seguin; John Tulip, and Kyong H. Nam, all of Edmonton, Canada, assignors to Canadian Patents & Dev. Limited, Ottawa, Canada

Filed Aug. 6, 1979, Ser. No. 64,093
Claims priority, application Canada, Jun. 14, 1979, 330140
Int. Cl.³ H01S *3/09*
U.S. Cl. 331—94.5 PE **5 Claims**



1. In an electric discharge gas laser, the improvement comprising:

(a) a flat plate of non-conducting material positioned in the laser in spaced relation to the laser anode to define a discharge region therebetween,

(b) a two-dimensional array of metal sub-electrode rods passing through the plate and having

(c) their upper ends lying flush with the surface of the plate,

(d) a block of dielectric material positioned below the plate and containing a series of transverse channels therein,

(e) electric current conductors lying in the channels and adapted for connection to a power supply,

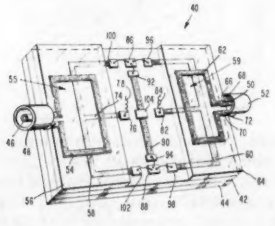
(f) the lower ends of the said rods passing through openings in the block into the channels to define a predetermined uniform gap between the ends of the rods and the electrical conductor, and

(g) a liquid electrolyte solution filling the channels and electrically connecting the sub-electrode rods and the conductors.

4,288,759
MICROWAVE TRANSFORMER

Harry L. Stover, 99 E. Middle Field Rd., Mountain View, Calif. 94043

Filed Jan. 28, 1980, Ser. No. 116,121
Int. Cl.³ H01P *5/00*
U.S. Cl. 333—24 R **10 Claims**



1. A center-tapped transformer for transferring energy having a center frequency $1/\lambda$ comprising:

(a) first coupling means including an elongated member and a stub member, said stub member having first and second ends, said first end conductively engaged to the center of said elongated member;

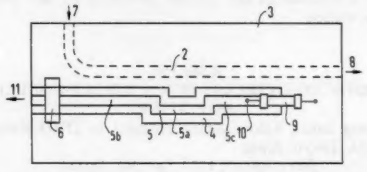
(b) second coupling means comprising a loop overlying and inductively engaged to said first coupling means; and

(c) means for providing a reactive impedance conductively engaged to said stub member at a distance of a multiple of one-quarter λ from the first end of said stub member.

4,288,760
STRIP LINE DIRECTIONAL COUPLER

Franz Beyer, and Peter Schucht, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 31, 1979, Ser. No. 71,540
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838317
Int. Cl.³ H01P *5/18*
U.S. Cl. 333—116 **8 Claims**

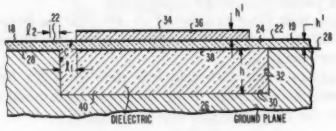


1. A directional coupler capable of being built in strip line technology, comprising two transmission lines coupled to each other and formed on opposite surfaces of a dielectric supporting plate and the ends of said transmission lines forming connecting points and with one transmission line formed as a microstrip line with a first strip line on one surface of said dielectric supporting plate and an electrical conducting grounded line surface formed on the opposite surface of said supporting plate, and wherein the other one of said transmission lines is formed as a coplanar line and comprises a second strip line (**5**) mounted on said opposite surface of said supporting plate in an area (**4**) which is free of said grounded line surface (**3**) and wherein said second strip line (**5**) is essentially parallel to said first strip line (**2**) of the microstrip line and wherein said second strip line (**5**) and said first strip line (**2**) are positioned on said dielectric plate such that energy is coupled between them along their lengths so that a directional coupler is formed.

4,288,761
MICROSTRIP COUPLER FOR MICROWAVE SIGNALS

Samuel Hopfer, Brooklyn, N.Y., assignor to General Microwave Corporation, Farmingdale, N.Y.

Filed Sep. 18, 1979, Ser. No. 76,767
Int. Cl.³ H01P *5/18*
U.S. Cl. 333—116 **5 Claims**



1. A microstrip coupler for microwave signals having a certain terminal impedance comprising:

a plurality of coplanar thin microstrip conductors having terminal portions, coupled portions extending over a certain distance with their edges in closely spaced parallel relation, and connecting portions between said terminal and coupled portions, said coupled and connecting portions being substantially wider than said terminal portions;

conductive means providing an electrical ground plane having different ground plane surfaces in different planes including a first planar surface having a certain dielectric

spacing to said terminal microstrip portions in accordance with the characteristic terminal impedance of said coupler, a second planar surface having a certain dielectric spacing to said coupled microstrip portions larger than said terminal spacing, and a connecting surface between said planar surfaces;

a first thin electrically conductive coupling member between one face of said coupled microstrip portions and said second ground plane surface and of a length less than the length of said second ground plane surface;

and a second thin electrically conductive coupling member extending over and dielectrically spaced from the opposite face of said coupled microstrip portions;

said connecting microstrip portions of said microstrip conductors extending in length between said first coupling member and at least said connecting ground plane surface to compensate for capacitive coupling between said connecting microstrip portions and said connecting ground plane surface.

4,288,762

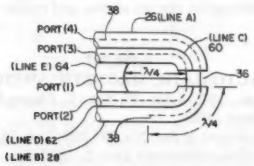
WIDEBAND 180° HYBRID JUNCTIONS

Gordon J. Laughlin, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 945,964, Sep. 26, 1978, abandoned. This application Apr. 11, 1980, Ser. No. 139,309

Int. Cl.³ H01P *5/19*

U.S. Cl. 333—117 **4 Claims**



1. An impedance-matched 180° hybrid junction comprising:

first, second, third and fourth electrically conductive arms, each arm terminating in a port, and a stub arm, the arms being formed from transmission lines having inner and outer conductor means,

said first arm interfacing with said stub arm such that the inner conductor means of said first arm is connected to the inner conductor means of said stub arm,

said second arm interfacing with said third arm such that the inner conductor means of said second arm is connected to the inner conductor means of said third arm,

the outer conductor means of said first arm and said stub arm having a gap at the interface of said first arm and said stub arm, the outer conductor means of said second and third arms having a gap at the interface of said second and third arms, said gaps being at the center of the hybrid junction, and said gaps being small in length, approximately ten percent of the wavelength at the highest frequency of operation,

the inner conductor means of said second and third arms being connected to the inner conductor means of said fourth arm at the center of said gap in the outer conductor means of said second and third arms,

said fourth arm having no outer conductor means along its inner conductor means for a distance of λ/4 from the connection point of the inner conductor means of said fourth arm and the inner conductor means of said second and third arms, λ being the wavelength at a central frequency of a frequency band of operation,

the outer conductor means of the first and second arms and the outer conductor means of said fourth arm being joined, and the outer conductor means of the third and stub arms and the outer conductor means of said fourth arm being joined, such that power sent into the port of said first arm is transmitted in equal amplitude but in anti-phase to said second and third arms and no power is transmitted to said fourth arm, and such that power sent into the port of said fourth arm is transmitted in equal amplitude and in phase to said second and third arms and no power is transmitted to said first arm.

4,288,763

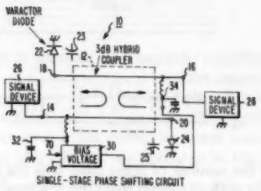
ANALOG PHASE SHIFTER

Samuel Hopfer, Brooklyn, N.Y., assignor to General Microwave Corporation, Farmingdale, N.Y.

Filed Sep. 18, 1979, Ser. No. 76,768

Int. Cl.³ H01P *1/18*

U.S. Cl. 333—164 **18 Claims**



1. An analog phase shifter for electrical signals at microwave radio frequencies within a certain broad bandwidth, said phase shifter comprising:

a hybrid coupler having a certain input impedance and including two reflection terminals, and two signal terminals respectively for receiving radio frequency signals from a source and for supplying said signals at a desired phase shift;

and separate similar means for producing a variable reactance connected to said reflection terminals to control the angle of signal reflectance thereat and thereby said phase shift, said variable reactance means, each producing an intermediate reactance approximately equal in magnitude to the input impedance of said coupler at an intermediate frequency of said bandwidth, and including means for varying said reactance over a certain range about said intermediate reactance in response to a control signal;

whereby said phase shifter is substantially independent of frequency over said bandwidth of radio frequencies.

4,288,764

SIGNAL PROCESSING DEVICES

Lip H. Ong, Birmingham, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 23, 1979, Ser. No. 87,609

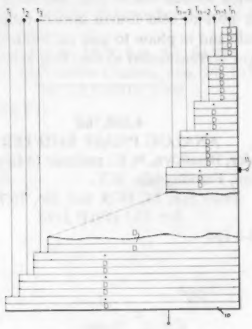
Claims priority, application United Kingdom, Oct. 25, 1978, 41849/78; Nov. 15, 1978, 44568/78

Int. Cl.³ H03K *5/159;* **G11C** *19/28;* **H03H** *17/08, 11/36*

U.S. Cl. 333—165 **2 Claims**

1. A signal processing device comprising a plurality of input taps, a plurality of delay stages, and a clock signal input, said input taps being arranged to receive a plurality of signals, said delay stages being arranged in the path of signals from each input tap such that signal samples may be transferred from one stage of said delay stages to another stage of said delay stages in response to a clock signal applied at said clock signal input, said clock signal, in use, having a duty cycle which varies linearly with time at a predetermined rate, and the number of said stages in the path of said signals from each of said input

taps being determined in accordance with the predetermined function:



$$x_n = \frac{\log\left\{\frac{(1+r)}{(1+r)-r(n-1)}\right\}}{\log(1+r)} + 1$$

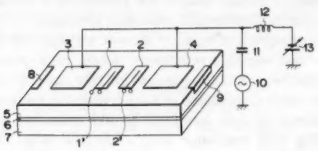
where n is the number of input taps, x_n is the number of delay stages in the path of signals from the nth input tap, and r is the rate of change of the clock duty cycle.

4,288,765

FREQUENCY SELECTOR APPARATUS

Nobuo Mikoshiba, Sendai, and Shoichi Minagawa, Urawa, both of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1979, Ser. No. 44,513
Claims priority, application Japan, Jun. 6, 1978, 53/67289
Int. Cl.³ H03H *9/72, 9/64, 9/68;* **H03F** *7/00*
U.S. Cl. 333—195 **11 Claims**



1. A frequency selector apparatus comprising:
a piezoelectric element;
elastic surface wave transducer means disposed in an acoustic wave propagation track formed in said piezoelectric element, said elastic surface wave transducer means comprising a signal input transducer and a signal output transducer;
reflecting electrode means disposed in said acoustic wave propagation track; and
exciting power source means connected to said reflecting electrode means, wherein said exciting power source means comprises an a.c. signal source and a d.c. bias source.

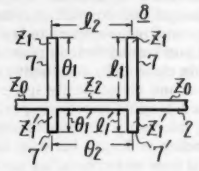
4,288,766

MICROWAVE CIRCUIT

Toshimichi Okita, Hatano, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 8, 1979, Ser. No. 92,639
Claims priority, application Japan, Nov. 13, 1979, 53-139713
Int. Cl.³ H03H *1/203, 3/08*
U.S. Cl. 333—204 **1 Claim**

1. A microwave circuit comprising, a dielectric; a transmission line mounted on one surface of said dielectric, a conductor mounted on the other surface of said dielectric, and at least two stubs provided on said transmission line at different positions thereof, said two stubs extending transversely to said transmission line on one side thereof for a distance l_1, and having electrical angles of θ_1 and spaced apart a distance l_2 and an electrical angle of θ_2, at least one of said stubs extending across said transmission line on both sides of said transmission line and



having a different length l_1', and electrical angle θ_1' which differ from l_1 and θ_1 and wherein

$$(\tan\theta_1+\tan\theta_1')\tan\theta_2=2$$

and

$$\tan\theta_1 = \tan\frac{2\pi}{\lambda A}l_1 = \infty$$

$$\tan\theta_1' = \tan\frac{2\pi}{\lambda' A}l_1' = \infty$$

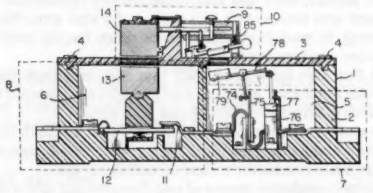
where λA and $\lambda' A$ corresponds to frequencies f_A and f_A' where maximum attenuation occurs above and below the pass band.

4,288,767

AUTOMATIC MAGNETIC SWITCH

Wen-Fong Lee, 13-2, Lane 79, Sec. 1, Chung-Kung Rd., Tai-chung, Taiwan (400)

Continuation-in-part of Ser. No. 751,209, Dec. 16, 1976, Pat. No. 4,150,350. This application Dec. 8, 1978, Ser. No. 967,712
Int. Cl.³ H01H *73/02, 73/30*
U.S. Cl. 335—6 **20 Claims**



1. An automatic magnetic switch comprising a switch casing having a cover, over-load and short-circuit protection means installed in a first chamber of said switch casing, a manual magnetic switch installed in a second chamber of said switch casing, and a magnetic control means at least partially contained in a sub-casing arranged on the cover, said manual magnetic switch having a first electrically conductive plate or means fixedly mounted within said casing; a first electrical contact on said first electrically conductive plate or means; a generally rigid and inflexible second electrically conductive plate or means mounted within said casing for movement between engaging and disengaging positions with respect to said first electrically conductive plate or means; a second electrical contact on said second electrically conductive plate or means arranged to make and break contact with said first electrical contact in the respective engaging and disengaging positions of said second electrically conductive plate or means; resilient means for urging said second electrically conductive plate or means to one of said engaging and disengaging posi-

tions; said magnetic control means cooperating with said second electrically conductive plate or means and including actuatable means movable proximate to and away from an accessible wall on the opposite side thereof with respect to said second electrically conductive plate or means, said magnetic control means being actuatable by said over-load and short-circuit protection means to thereby automatically switch off power in the magnetic switch upon the occurrence of an overload or short-circuit condition in said conductive plates and contacts, movement of said actuatable means proximate to said accessible wall moving said second electrically conductive plate or means to the other of said engaging and disengaging positions without material flexure or deformation thereof.

4,288,768

ELECTRICAL FULL PROTECTION CIRCUIT BREAKER

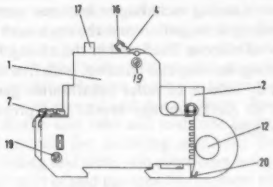
Hans Arnhold, Kälberau, and Peter Flohr, Kahl, both of Fed. Rep. of Germany, assignors to Firma Heinrich Kopp GmbH & Co. KG., Kahl, Fed. Rep. of Germany

Filed Jul. 30, 1979, Ser. No. 62,166

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834327

Int. Cl.³ H01H *83/02*

U.S. Cl. 335—18 **10 Claims**



1. An electrical full protection circuit breaker for interrupting the current circuit in response to an overload current, a short circuit current, or an earth leakage or fault current, comprising the structural and functional combination of single pole circuit breaker means with an earth leakage current circuit breaker means, each having a narrow structure and the same housing contour, said leakage current circuit breaker means comprising its own contact interruption means (10, 11) and its own outwardly located terminal connection zone including a summing current transformer means accessible from outside the circuit breaker and constructed as a bushing transformer located in said terminal connection zone for operatively electrically coupling with the single pole circuit breaker means through connecting conductors leading to the circuit breaker means for detecting current, and means operatively mechanically coupling said single pole circuit breaker means and said leakage current circuit breaker means in switching engagement to form an effective double pole circuit breaker combination.

4,288,769

AMBIENT TEMPERATURE RESPONSIVE TRIP DEVICE FOR STATIC TRIP CIRCUIT BREAKERS

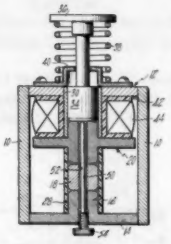
Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 28, 1979, Ser. No. 98,095

Int. Cl.³ H01H *9/00*

U.S. Cl. 335—173 **13 Claims**

1. In an electromagnetic trip device including a plunger reciprocally mounted for movement between a retracted position and an extended position, a spring biasing the plunger to its extended position, a permanent magnet developing a holding flux in a holding flux path including the plunger, the holding flux providing sufficient magnetic holding force on the plunger to hold the plunger in its retracted position against the bias of the spring, and an electromagnet selectively electrically energized to develop flux in the flux path opposing the holding flux whereby the magnetic holding force is diminished to the extent that the spring becomes overpowering and thus acts to propel the plunger to its extended position effective in initiating tripping of a circuit breaker, a thermal trip override comprising a temperature response element acting in response to an excessive ambient temperature condition within a circuit



breaker enclosure to increase the magnetic reluctance of the holding flux path at a predetermined location therein, thereby to reduce the magnitude of the holding flux flowing in the plunger and thus reduce the magnetic holding force exerted thereon to the extent that the spring becomes overpowering and the plunger is propelled by the spring to its trip initiating, extended position.

4,288,770

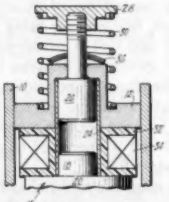
THERMAL OVERRIDE FOR STATIC TRIP CIRCUIT BREAKERS

Stephen F. Gillette, Rocky Hill, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 28, 1979, Ser. No. 98,097

Int. Cl.³ H01H *9/00*

U.S. Cl. 335—173 **10 Claims**



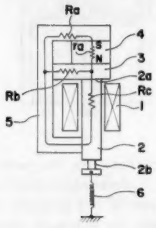
1. For incorporation in an electromechanical trip device including a permanent magnet for developing a holding flux to create a magnetic force on a plunger sufficient to hold the plunger in a retracted position against the bias of a spring and an electromagnet for selective electrical energization to develop flux in opposition to the holding flux, whereby the magnetic holding force on the plunger is diminished to the extent that the spring becomes overpowering, whereupon the plunger is propelled by the spring to an extended circuit breaker trip initiating position, a thermal trip override comprising a thermal-mechanical element acting to exert a force on the plunger aiding the spring force such as to overpower the magnetic holding force when the temperature becomes excessive whereupon the plunger is propelled to its extended, circuit breaker trip initiating position by the spring.

4,288,771

ELECTROMAGNETIC DRIVEN DEVICE

Hiroshi Ueda, Nara, and Shigeru Oyokota, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 8, 1980, Ser. No. 119,775
Claims priority, application Japan, Feb. 16, 1979, 54-17586
Int. Cl.[3] H01F *7/08*
U.S. Cl. 335—230 16 Claims



1. An electromagnetically driven device comprising:

a coil adopted to be energized by the application of an electric power thereto;

a plunger made of magnetic material and inserted in the hollow of the coil for movement in an axial direction of the hollow of the coil between an inserted position and an ejected position;

an armature made of magnetic material and having first, second and third faces, said first face of the armature being positioned to confront with one end of the coil, one end of the plunger contacting said first face of the armature when said plunger is moved to its inserted position;

a permanent magnet having first and second polar faces, said first polar face of the permanent magnet being held in contact with the second face of the armature for magnetizing the armature, said plunger being held in the inserted position, when said coil is deenergized, by a magnetic attractive force developed between the first face of the armature and the plunger, and said plunger being released from the magnetic attractive force in readiness for movement from the inserted position towards the ejected position when said coil is energized to counterbalance said magnetic attractive force;

a yoke made of a magnetic material and arranged for establishing a main magnetic circuit for the magnetic flux generated by said coil and said permanent magnet, and a bypass magnetic circuit for the magnetic flux generated by said permanent magnet, said main magnetic circuit being established through said yoke, said first and second faces of said armature and said first and second polar faces of said permanent magnet while said bypass magnetic circuit is established through said yoke, said second and third faces of said armature and said first and second polar faces of said permanent magnet;

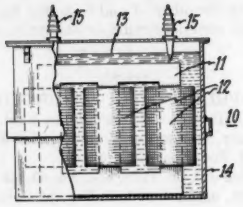
means for presenting a predetermined reluctance between the third face of the armature and said yoke for bypassing predetermined flux emanated from the first polar face of the permanent magnet through the armature and the yoke without passing through the plunger to control the magnetic attractive force between the first face of the armature and the plunger.

4,288,772

DIELECTRIC LIQUID IMPREGNATED WITH GASES FOR USE IN TRANSFORMERS

Ian H. MacBeth, Egremont, Mass., assignor to General Electric Company, N.Y.

Continuation of Ser. No. 969,246, Dec. 13, 1978, abandoned.
This application Mar. 6, 1980, Ser. No. 127,686
Int. Cl.[3] H01F *27/10;* H01B *3/20*
U.S. Cl. 336—58 2 Claims



1. A transformer having improved 60 Hertz voltage breakdown characteristics comprising:

a transformer casing including at least one core and at least one winding arranged around the core; and

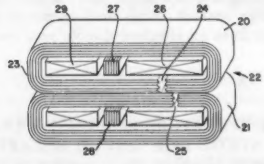
a quantity of silicone fluid within the casing for insulating and cooling the core and winding, with five to twenty-five percent by volume of sulfur hexafluoride gas for improving the 60 Hertz voltage breakdown properties of the silicone fluid.

4,288,773

AMORPHOUS METAL BALLASTS AND REACTORS

Robert P. Alley, Manlius, and Russell E. Tompkins, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 6, 1978, Ser. No. 966,855
Int. Cl.[3] H01F *17/06, 71/08, 77/24*
U.S. Cl. 336—160 6 Claims



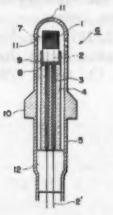
1. An amorphous metal inductive device for ballast and reactor applications comprising a pair of coplanar generally "O" shaped magnetic cores, each constructed of nested almost closed loops of amorphous metal strip having loop openings located along one core side, the core sides with such openings being adjacent to and in contact with one another to be the center leg of a magnetic structure, said amorphous metal loop openings in each core are aligned to define a constant gap of predetermined length, the gap in one core being separated from the gap in the other core, and at least one coil mounted on said center leg magnetically coupled with said cores.

4,288,774

GAS DETECTOR

Akio Takami; Toshitaka Matsuura, and Tsutomu Saito, all of Wagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jan. 17, 1980, Ser. No. 112,977
Claims priority, application Japan, Jan. 18, 1979, 54-5649[U]
Int. Cl.³ H01L *7/00*
U.S. Cl. 338—34 **4 Claims**



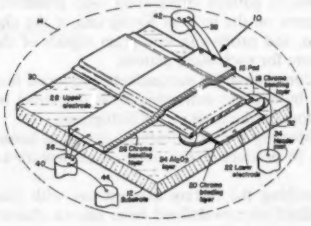
1. A gas detector comprising: a gas sensitive element having an electrical resistance which varies with the type of gas with which said element is in contact, at least first and second electrodes coupled to said gas sensitive element, lead wires operatively coupled to said electrodes of said gas sensitive element, a ceramic insulator tube for supporting said gas sensitive element, said gas sensitive element having a lower part and an upper part, the lower part of said gas sensitive element being positioned in a slot in said tube and said tube having through holes provided therein for receiving said lead wires and a housing for enclosing said tube, said electrodes being provided only in the upper part of said gas sensitive element which is not positioned within said insulator tube.

4,288,775

DEVICE AND METHOD OF MANUFACTURING A RELATIVE HUMIDITY SENSOR AND TEMPERATURE SENSOR

Paul F. Bennewitz, and Matt C. Bennewitz, both of 623 Wyoming, S.E., Albuquerque, N. Mex. 87123

Filed Nov. 9, 1979, Ser. No. 92,766
Int. Cl.³ H01L *7/00*
U.S. Cl. 338—35 **6 Claims**



1. A semiconductor for use as a sensor for detecting relative humidity comprising:

a lower electrode formed from a noble metal;

an essentially pure layer of Al_2O_3 having a thickness ranging from approximately 120 angstroms to 5000 angstroms deposited on said lower electrode, said layer of Al_2O_3 having a disordered crystalline structure and a density gradient which varies progressively through the thickness of said layer of Al_2O_3 from a less dense structure at the lower surface of said layer of Al_2O_3 adjacent said lower electrode to a more dense structure at the upper surface of said layer of Al_2O_3;

an upper electrode deposited on said upper surface of said layer of Al_2O_3, said upper electrode having a thickness ranging from approximately 7 Å to approximately 1000 Å;

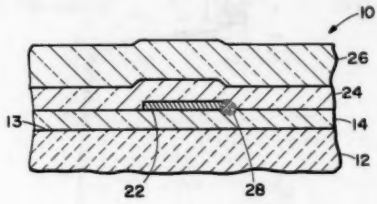
whereby said disordered crystalline structure and said density gradient of said layer of Al_2O_3 function to produce a linear response to relative humidity from said sensor.

4,288,776

PASSIVATED THIN-FILM HYBRID CIRCUITS

Robert E. Holmes, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 910,178, May 30, 1978, Pat. No. 4,210,500. This application Jan. 9, 1980, Ser. No. 110,562
Int. Cl.³ B05D *3/06*
U.S. Cl. 338—308 **10 Claims**



1. A method for manufacturing a thin-film electrical microcircuit structure containing a laser-trimmed circuit element, which structure includes an unfractured silicon nitride passivation layer, comprising the subsequential steps of:

(a) forming a first layer of an insulating oxide on a substrate,

(b) forming a thin-film electrical circuit element on the first oxide layer, said element being formed from a material containing a metal capable of reacting with silicon nitride at the temperature produced by laser trimming of the element to form a metal nitride having a dissociation temperature no higher than the first-mentioned temperature,

(c) forming a second layer of an insulating oxide over the circuit element and adjacent portions of the first oxide layer,

(d) depositing a layer of silicon nitride over the exposed surface of said second layer, and

(e) trimming the thin-film circuit element to a desired value by removing portions of the element with a laser beam directed through said silicon nitride layer and second oxide layer.

6. A microcircuit structure comprising

a substrate having a first layer of an insulating oxide on a surface thereof, said layer having a minimum average thickness of about 1,000 angstroms,

a thin-film electrical component disposed on said first oxide layer, said component being formed from a material containing a metal capable of reacting with silicon nitride at the temperature produced by laser trimming of the component to form a metal nitride having a dissociation temperature no higher than the first-mentioned temperature, and

an unfractured protective coating covering said component and adjoining surface areas of the first oxide layer, said coating including a second layer of an oxide deposited to a minimum average thickness of about 1,000 angstroms on said component's and the first oxide layer's surface areas, and an overlying layer of silicon nitride,

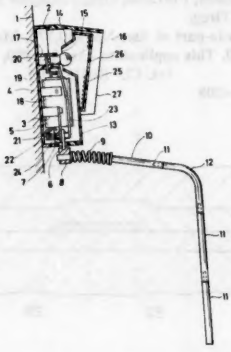
said structure including a relatively high resistance region within the portions of said oxide layers that adjoin said component, said region being formed by laser trimming of the component through said protective coating and containing a stable reaction product of said metal with the material forming said oxide layers.

4,288,777

PARKING AID

Manfred Luik, Ulmer Str. 18, 7250 Leonberg, Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 56,103
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2830604; Jan. 8, 1979, 2900489
Int. Cl.³ G08G 1/14; H01H 3/16, 19/00
U.S. Cl. 340—51 17 Claims



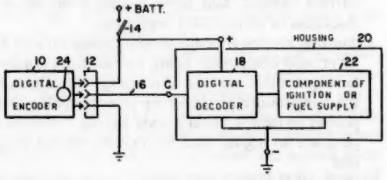
1. A parking aid for vehicles approaching an obstacle, particularly a wall of a garage, comprising signal generating means; and actuating means operatively connected with said signal generating means to trigger the same when contacted by an approaching vehicle, said actuating means comprising a resiliently mounted contact member coupled with said signal generating means, a feeler member having an upper part extending outwardly from the obstacle and a lower part extending vertically downwardly from said upper part, and a resilient spring having spaced end portions connected to said upper part of said feeler member and to said contact member, respectively.

4,288,778

ELECTRONIC THEFT PREVENTION APPARATUS FOR VEHICLES

Yehuda Zucker, 6 Gan Yavne St., Rishon Le Zion, Israel

Filed Jul. 2, 1979, Ser. No. 53,794
Claims priority, application Israel, Jul. 2, 1978, 55057
Int. Cl.³ B60R 25/04, 25/10
U.S. Cl. 340—64 16 Claims



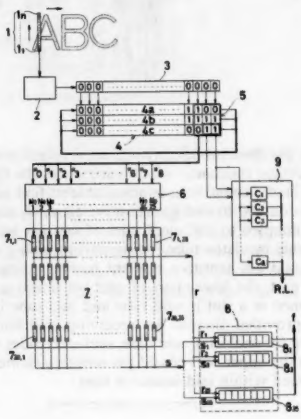
1. Vehicle theft prevention apparatus comprising:
decoder means integrally formed with a vehicle component and selectively enabling the operation thereof;
encoder means accessible to a vehicle operator for providing coded instructions to the decoder means to enable operation of said vehicle component; and
data coupling means for interconnecting said decoder means and said encoder means to permit data transfer therebetween, whereby application of a constant battery voltage to said data coupling means is not effective to operate said decoder means.

4,288,779

METHOD AND APPARATUS FOR CHARACTER READING

Nobuyuki Otsu, Tokyo; Shunji Mori, Kashiwa, and Taiichi Saito, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Jul. 5, 1979, Ser. No. 54,704
Claims priority, application Japan, Jul. 8, 1978, 53/82512
Int. Cl.³ G06K 9/68
U.S. Cl. 340—146.3 Y 5 Claims



1. A character reading method for character recognition, comprising the steps of:
(a) subjecting a string of character patterns to continuous discrimination scanning carried out by one column in the row direction on the character patterns to produce a digital binary signal derived from the character pattern information of the column being scanned;
(b) matching sequentially the digital binary signal containing character pattern information with predetermined mask patterns on the basis of histograms of the character patterns, and producing histogram signals of the character feature for each mask pattern;
(c) accumulating the successively produced histogram signals by additive extraction so as to extract local feature vectors on the basis of the histograms;
(d) subjecting the local feature vectors to linear consolidation to produce lower dimensional feature axis vectors, and
(e) matching the feature axis vectors with predetermined standard vectors defined from known character categories.

4,288,780

PATTERN RECOGNITION SYSTEM

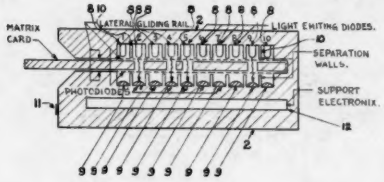
Alexander S. Theodoru, 210 Thames St., New London, Conn. 06320, and Stefan G. Theodoru, 28-18 29th St., Long Island City, N.Y. 11102

Filed Jul. 12, 1979, Ser. No. 57,098
Int. Cl.³ G06K 7/14
U.S. Cl. 340—146.3 Z 22 Claims

1. A pattern recognition system comprising:
a thin card having a matrix array, said card being coded by perforating a plurality of elements of said matrix array in a pattern to be recognized;

a card reader, said reader having means for receiving said card and producing an electrical signal for every matrix position on said card;

a comparator including, an matrix array of radiant energy emitting elements said array of radiant energy emitting elements being arranged such that each one of said radiant energy emitting elements matches in number and location, a different one of said elements of said matrix array of said card and an array of radiant energy sensors identical to said array of radiant energy emitting elements, each being sensor optically aligned with a different one of said radiant energy emitting elements of said array of radiant energy emitting elements, said comparator having a pre-set code



such that said comparator provides a "1" logic level output signal when said pre-set code in said comparator matches exactly the code on said card when said card is inserted into said reader and provides a "0" logic level output signal when said pre-set code in said comparator and the code in said card do not match exactly when said card is inserted into said reader, said reader providing input signals to said comparator indicative of the code of a card inserted into said reader,

an array of Schmitt trigger circuits, means for coupling the said electrical signals from said card reader to a corresponding one of said Schmitt trigger circuits, and means for coupling the outputs of said Schmitt trigger circuits to said comparator.

4,288,781

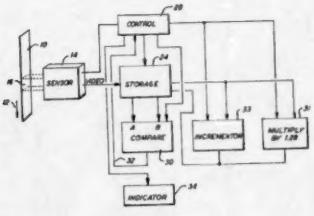
CURRENCY DISCRIMINATOR

Harvey R. Sellner, Newtown, and Robert T. Wada, Ridgefield, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 960,156, Nov. 13, 1978. This application Jul. 24, 1979, Ser. No. 60,090

Int. Cl.³ G06K *9/00*

U.S. Cl. 340—146.3 Q **9 Claims**



1. Apparatus for identifying the denomination of a bank note or the like comprising, in combination:

means for directing a source of light onto one surface of the bank note whose denomination is to be determined;

means for measuring the reflectance of light from a plurality of incremental areas disposed across the length of the bank note whose denomination is to be determined;

means for comparing the reflectance of light from each incremental area with the reflectance of light from each of a preselected plurality of other incremental areas of said bank note taken in a preselected sequence and producing a first correlation signal responsive to said comparisons for each incremental area; and

means for comparing said first correlation signals to second reference correlation signals corresponding to each denomination identifiable by the apparatus to determine the denomination of the bank note to be identified.

4,288,782

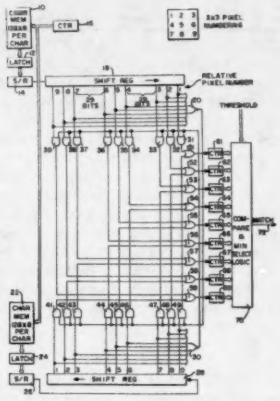
HIGH SPEED CHARACTER MATCHER AND METHOD

Ronald S. Bader; Lyle V. Rennick, both of Cupertino, and Robert H. Wallis, Portola Valley, all of Calif., assignors to Compression Labs, Inc., Cupertino, Calif.

Filed Aug. 24, 1979, Ser. No. 69,258

Int. Cl.³ G06K *9/68*

U.S. Cl. 340—146.3 Q **13 Claims**



1. In a high speed character matching apparatus, the method comprising the steps of storing digital pixel data representing first and second characters, respectively, forming an array for each pixel of said first and second characters where each pixel of said first and second characters is the center element of said array surrounded by its nearest neighboring pixels, determining whether each center pixel is in a first state, determining whether any pixel in the corresponding array of said second character is in said first state or in a second state, different from said first state, and counting the number of pixels of said center pixel and said corresponding array when said pixels are in said first state.

4,288,783

DEVICE FOR SELECTIVELY AUTHORIZING PASSAGE THROUGH A DOOR

Dominique Chauvat, Chalet des Mounines, Bressolles, 03000 Moulins, and Michel Charpentier, 42 avenue des Jardins Anglais, 77410 Claye-Souilly, both of France, assignors to Dominique Chauvat, Moulins; Michel Charpentier, Claye-Souilly and S.A. Emile Chauvat et Sofranq Reunis, Moulins, all of, France, a part interest to each

Filed May 23, 1980, Ser. No. 152,465

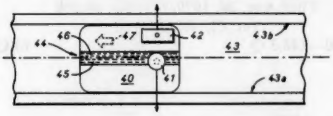
Claims priority, application France, May 23, 1979, 79 13078

Int. Cl.³ H04Q *3/00*; G06K *5/00*

U.S. Cl. 340—149 A **10 Claims**

1. A device for selectively authorizing the bearer of a coded card to pass through a door in a wall, the device comprising: a card reader located in the vicinity of the door and accessible from the or each approach side thereof, said card reader being responsive to the insertion of a card by reading a digital signal recorded on the card and comprising a path along which the card is moved, extending longitudinally between opposite sides

of the aforementioned wall and terminating at its opposite ends in respective slots with respective card sensors, a bidirectional drive system for moving a card in either of two opposite directions along said path and a read head centrally located on said card path to read the aforementioned signal from a longitudinal track centrally located on the card; means for opening or permitting opening of the door in response to an electrical command signal; a logic unit including a memory and connected to said card reader and said door opening means to compare the read digital signal with a plurality of digital signals stored in said memory and responsive to equality of said read signal with at least one of said stored signals by sending an electrical command signal to said door opening means, said



logic unit being responsive to insertion of a card in the first of said slots by causing said drive system to operate in such a way as to move the card in a first direction from said slot to a position beyond said read head and selectively responsive to comparison of the signal read from the card with the aforementioned plurality of signals by causing said drive system to operate in such a way as to move the card in a second direction opposite to said first direction so as to return it to the first slot, or by sending an electrical command signal to said door opening means; and means responsive to closure of the door following the sending of said electrical command signal to said door opening means by causing said drive system to operate in such a way as to move the card to the second slot.

4,288,784

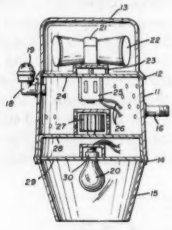
LIGHT AND ALARM DEVICE

Andrew Fusco, 52 Winchester, Youngstown, Ohio 44509

Filed Oct. 31, 1979, Ser. No. 89,997

Int. Cl.³ G08B *1/08, 7/00*

U.S. Cl. 340—326 **4 Claims**



1. A security light and alarm device consisting of a housing having light transmitting extensions on its upper and lower ends, a rotatable socket assembly positioned in the extension on said upper end thereof, at least one alarm lamp mounted in said rotatable socket assembly, a power source, a circuit in connection with said power source and said rotatable socket assembly for energizing said rotatable socket assembly and alarm lamp and means for imparting rotary movement to said rotatable socket assembly, a security light located in said light transmitting extension on the lower end of said housing, a circuit in connection with said power source and said security light, a photocell positioned exteriorly of said housing and arranged to receive light from said alarm lamp and controlling said circuit connecting said power source and said security light, said photocell arranged to disconnect said security light by interrupting said circuit thereto upon actuation and rotation of said alarm lamp, and separate means for controlling said circuit in connection with said power source and said rotatable socket assembly and the alarm lamp and said means for imparting rotary movement to said socket assembly and wherein said security light is a mercury vapor type.

4,288,785

LIGHT INTENSITY MODULATOR WITH DIGITAL CONTROL AND A DIGITAL-ANALOG CONVERTER COMPRISING SUCH A MODULATOR

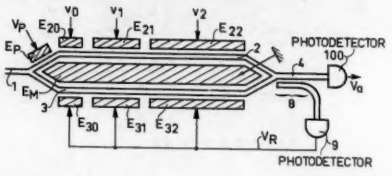
Michel Papuchon; Claude Puech, and Jean C. Anne, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 20, 1980, Ser. No. 151,616

Claims priority, application France, May 23, 1979, 79 13194

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **8 Claims**



1. A digitally controlled light intensity modulator comprising, on the surface of a substrate having electro-optical properties, a two-arm interferometer connected to an input guide receiving incident optical radiation, the fractions of radiation propagated in the two arms combining at the output of the interferometer in an output guide, the intensity of the emerging radiation depending on the phase shift introduced into the interferometer between the fractions of radiation propagated in the two arms, wherein the phase shift is the sum of n elementary phase shifts successively created along the interferometer respectively by n digital control voltages, these n elementary phase shifts being produced in conformity with a geometrical progression of common ratio **2**.

4,288,786

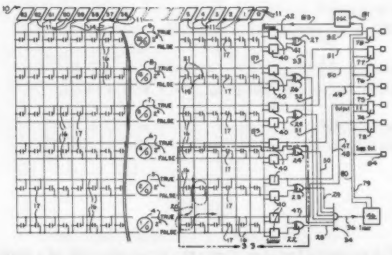
TOUCH SENSING KEYBOARD CONSTRUCTION

Ferenc Ledniczki, Foster City, and Richard J. Patak, San Jose, both of Calif., assignors to Touch Activated Switch Arrays, Inc., Santa Clara, Calif.

Filed Jan. 15, 1979, Ser. No. 3,708

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—365 S **2 Claims**



1. A keyboard construction comprising a predetermined number of keys disposed in an array for operation therein, said keys when operated serving to provide an associated output signal related thereto, encoding means comprising a first series of conductors operatively coupled to said keys for electrically sensing operation of said keys, a series of pairs of conductors common to said first series of conductors, each of said pairs representing a binary number, means for coupling a signal

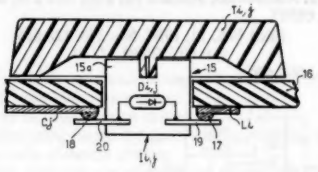
representative of the operation of each one of said first series of conductors to one or the other conductor of each of said pairs of conductors to represent a first or second state thereof, and means coupled to said pairs of conductors for providing a binary output representation for each of said keys when so operated, means disposed downstream of said encoding means for detecting the operation of each key, and validity checking means responsive to the detection of the operation of said keys and serving to preclude an output from the system upon finding an invalid condition in the operation of said keys, said validity checking means being disposed downstream of said encoding means.

4,288,787

CONTROL KEYBOARD WITH SWITCHES OF MECHANICAL CONSTRUCTIONS

Edouard Serras-Paulet, Casa Nostra - Péch des Treilles, 82240 Puylaroque, France

Filed Apr. 3, 1979, Ser. No. 26,763
Claims priority, application France, Jan. 17, 1979, 79 01101
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 R **5 Claims**



1. A keyboard wherein each key is provided with a magnetic biasing means for urging the same back to a rest position and is operatively coupled to at least one single-pole switch, each switch comprising a movable contact part including two conducting elements electrically insulated from each other and wherein said switches are electrically connected to a system of conductors arranged in a matrix-like array with m rows and n columns, each row and each column being carried out as a conductor so that any switch having the coordinates i, j is connected between the row i and the column j of said system and adapted in the rest position of the switch to contact in engaging relationship, two terminals electrically connected to the corresponding conductors of the row and of the column of said system and a diode-like element associated with said switch being connected across both conducting elements, wherein the improvement consists in that each of said switches is of the normally closed contact type and comprises a diode-like element, said diode-like element being inserted within an insulating portion of said switch, said insulating portion forming an anchoring support keeping both conducting elements spaced from each other, said diode-like element being connected in series within the switch, the direction of connection of all said diodes being the same between the rows and the columns.

4,288,788

ELECTROSTATIC ALPHA-NUMERIC DISPLAY

Wesley A. Rogers, Grosse Pointe Park, and James J. Laggan, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 19, 1980, Ser. No. 150,896
Int. Cl.³ G08B *5/00*
U.S. Cl. 340—378.2 **4 Claims**

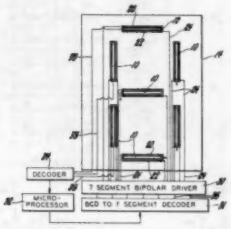
1. A display device comprising

an array of controllable bistable movable electret elements which change in appearance upon change of position so that a desired visible pattern is produced by selective positioning of the elements,

each electret element having a pivot axis about which it can rotate to either of two stable positions and two opposed edge portions spaced from the pivot axis and bearing opposite electrical charges,

a frame member having an array of windows each provided with pivot points for rotatably supporting an electret element,

pairs of conductive strips on opposite sides of the windows,



each strip disposed adjacent a charged edge portion of an electret element, whereby when voltage is applied across each pair of strips electrostatic forces are developed on the charged edges to selectively rotate or hold still the electret elements, and

means for supplying control voltages to the strips to effect a visible display pattern by selective positioning of electret elements.

4,288,789

ALARM SYSTEM WITH VERBAL MESSAGE

George C. Molinick, Box No. 111, Twin Rock, Pa. 15960, and Roger W. Shields, Ebensburg, Pa., assignors to George C. Molinick, Manor, Pa.

Filed Sep. 14, 1979, Ser. No. 75,242
Int. Cl.³ G08B *19/00*
U.S. Cl. 340—524 **5 Claims**

1. An audible warning system for simultaneously providing two distinct audible signals, the first such signal being representative of one of a plurality of abnormal non-emergency conditions and the second such signal being representative of an abnormal emergency condition, comprising:

(a) a plurality of first sensors for detecting said abnormal non-emergency conditions;

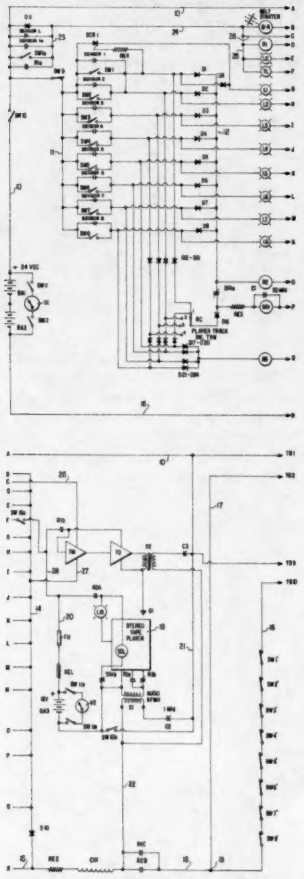
(b) a multi-track record player with a recording medium having a plurality of verbal messages prerecorded thereon in different channels corresponding to said abnormal non-emergency conditions;

(c) means for activating the record player to play the appropriate verbal message over a speaker device triggered by operation of one of said first sensors;

(d) at least one second sensor for detecting an abnormal emergency condition; and

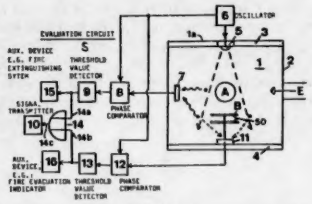
(e) a tone generator for generating and broadcasting an

emergency warning tone over said same speaker device in response to the activation of said second sensor simultaneously with the playing of said appropriate prerecorded verbal message.



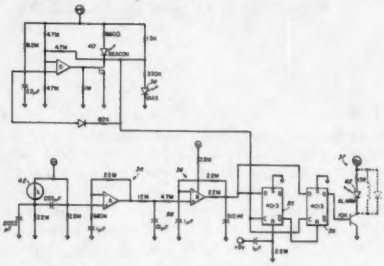
4,288,790
FIRE ALARM
Walter Schnell, Herzogenbuchsee, Switzerland, assignor to Cerberus AG, Männedorf, Switzerland
Filed Jan. 10, 1980, Ser. No. 110,900
Claims priority, application Switzerland, Feb. 26, 1979, 1867/79
Int. Cl.³ G08B 17/10
U.S. Cl. 340—628 **11 Claims**

1. A fire alarm comprising:
a measuring chamber accessible to air to be monitored for the presence of smoke and aerosol particles;
a radiation source operated in a pulsed mode for transmitting electromagnetic radiation in the measuring chamber;
an acoustical receiver for taking-up air vibrations produced by the absorption of radiation pulses by the particles; and



an evaluation circuit connected with said acoustical receiver for delivering a signal as soon as the intensity of the air vibrations exceeds a predetermined threshold.

4,288,791
SMOKE DETECTOR AND METHOD
William J. Malinowski, Johnson St., P.O. Box 274, Bryantville, Mass. 02327
Filed Feb. 11, 1980, Ser. No. 120,635
Int. Cl.³ G08B 17/10
U.S. Cl. 340—630 **4 Claims**



2. A system for detecting an aerosol such as smoke or the like, comprising
(a) means defining an examination zone in which smoke and the like is adapted to pass,
(b) a photo responsive device mounted in position to monitor the zone,
(c) a first light source of relatively low intensity mounted in position to illuminate said photo responsive device and pre-bias said device by an amount corresponding to a predetermined concentration of aerosol in said zone,
(d) a second light source of relatively high intensity mounted in position to illuminate only said zone and any aerosol therein,
(e) power means for energizing said system,
(f) control means operatively connected to said power means, said light sources and said photo responsive device for cyclically operating said light sources in timed sequence of relatively long pulses of light from said first source and relatively short pulses from said second source whereby a relatively long pulse of light from said first source will illuminate said photo responsive device to pre-bias said device and generate a first output therefrom and a relatively short pulse of light from said second source after said long pulse will illuminate said zone and reflect against any aerosol present therein and onto said photo responsive device to generate a second output therefrom,
(g) detecting means for comparing said first and second electrical outputs, and,
(h) alarm means operatively connected to said detecting

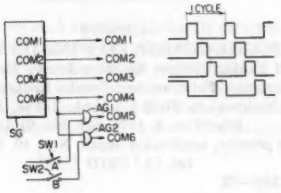
means and adapted to be actuated by said detecting means in the event that said second electrical output from said device produced by said short pulse of light is at least equal to said first electrical output.

4,288,792

ELECTRONIC APPARATUS WITH TIME-DIVISION DRIVE

Ichiro Sado; Juji Kishimoto, both of Tokyo, and Hiroshi Murata, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1978, Ser. No. 972,281
Claims priority, application Japan, Dec. 28, 1977, 52-160620
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—756 **15 Claims**



1. An electronic apparatus having a device to be driven on the time division basis, comprising:

a plurality of objects to be driven;

signal generating means for generating a plurality of signals of mutually different phases;

means for applying the plurality of signals obtained from said signal generating means to several of said driven objects;

means for producing additional signals from a certain one of the signals generated from said signal generating means, wherein said additional signals are applied to the remaining objects to be driven, said additional signal producing means including means for selecting among said remaining objects the object to be driven by said additional signals; and

means for generating information signals;

said device including means for receiving the additional signals from said additional signal producing means and the information signals from said information signal generating means to control the operation of said one object.

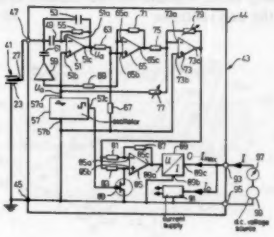
4,288,793

APPARATUS CONTAINING A CYLINDER WITH A DISPLACEABLE PISTON THEREIN AND A MEASURING TRANSDUCER ARRANGED ESSENTIALLY WITHIN THE CYLINDER

Bernhard Lötscher, Andelfingen, Switzerland, assignor to Rotovolumetric AG, Ebikon, Switzerland

Filed Apr. 23, 1979, Ser. No. 32,335
Claims priority, application Switzerland, May 11, 1978, 5125/78
Int. Cl.³ G08C *19/10*; G01L *9/12*
U.S. Cl. 340—870.37 **9 Claims**

6. An apparatus containing a cylinder, a displaceable piston provided with a longitudinal opening and being displaceable in the cylinder by means of a flow medium, a capacitive measuring transducer arranged essentially in the cylinder, which measuring transducer contains two mutually displaceable electrically conductive parts, of which the first is secured at the cylinder and extends into the longitudinal opening of the piston and the second part is connected with the piston and from which the second part protrudes into the lengthwise opening of the first, wherein the first measuring transducer part is electrically conductively connected with metallic parts of the cylinder and piston and the second measuring transducer part is electrically insulated in relation to the cylinder and the piston as well as guided, by means of an electrical connection out of the cylinder, wherein said second measuring transducer part is provided at its surface confronting the first measuring transducer part with an electrically insulating sleeve, which, together with said first measuring transducer part forms a



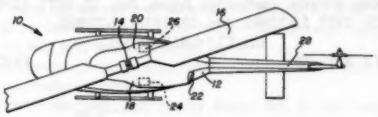
sliding seat, and the lengthwise opening of said first measuring transducer part into which said second measuring transducer parts protrudes, is connected by at least one through passage, thus allowing pressure equalization with the inner space of the cylinder.

4,288,794

SHIELDED LOOP VOR/ILS ANTENNA SYSTEM

Osborne, Gregory W.; William C. Ripley, both of Arlington, and Robert E. Wilson, Fort Worth, all of Tex., assignors to Textron Inc., Providence, R.I.

Filed Dec. 26, 1979, Ser. No. 106,285
Int. Cl.³ H01Q *1/28, 7/04*
U.S. Cl. 343—708 **21 Claims**



1. A VOR/ILS antenna system for rotary wing aircraft eliminating modulation of signals without varying speed of a mast driven rotor, comprising:

a pair of loop antennas, each having one or more closed loop windings, mounted and spaced on said aircraft in a generally horizontal plane on opposite sides of said mast;

each said antenna having a conductive shield covering said windings and dielectrically separated therefrom, each said shield having a small gap breaking the continuity thereof and facing the gap in the other shield; and

communication means including a pair of electrical leads for each said antenna extending through said shield from said windings at a point opposite said gap.

4,288,795

ANASTIGMATIC THREE-DIMENSIONAL BOOTLACE LENS

J. Paul Shelton, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 25, 1979, Ser. No. 88,191
Int. Cl.³ H01Q *19/06*
U.S. Cl. 343—754 **6 Claims**

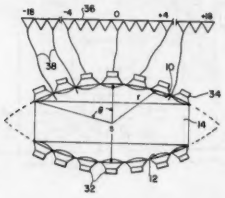
1. A three dimensional lens adapted to have electromagnetic energy transmitted thereacross for use in a planar antenna array comprising:

a first concave cap section including a plurality of radiators defining feed ports;

a second concave cap section including a plurality of radiators defining lens ports;

said concave cap sections facing each other and spaced apart on a central axis;

material filling the space between the facing concave cap sections having an index of refraction decreasing radially outwardly from a point on the central axis midway between the cap sections;



transmission lines connecting the lens ports with the planar antenna array;

whereby electromagnetic energy passing between said feed ports and lens ports is caused to take paths through the material whose path lengths are varied due to the changing index of refraction of the material for improved off-axis focusing of the antenna array for forming simultaneous multiple directive beams.

4,288,796

PHASE DETECTION IN AN INK JET SYSTEM PRINTER OF THE CHARGE AMPLITUDE CONTROLLING TYPE

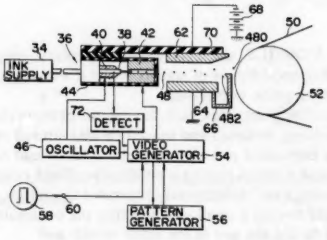
Masahiko Aiba, and Ikuo Umeda, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 21, 1978, Ser. No. 917,592

Claims priority, application Japan, Jun. 27, 1977, 52-76752; Jun. 28, 1977, 52-77501; Jun. 28, 1977, 52-77502

Int. Cl.³ G01D *18/00*

U.S. Cl. 346—75 **12 Claims**



1. In an ink jet system printer of the charge amplitude controlling type including an ink droplet issuance unit and a phase detection system associated therewith, an ink liquid supply system being connected to said ink droplet issuance unit for supplying ink liquid thereto, a plurality of ink droplets are formed and emitted from a nozzle of said ink droplet issuance unit, are charged in a charging tunnel of said ink droplet issuance unit, are emitted from said ink droplet issuance unit and travel toward a record receiving medium, said phase detection system comprising:

metal filter means positioned between said ink droplet issuance unit and said ink liquid supply system, said metal filter means receiving said ink liquid from said ink liquid supply system and being in contact with said ink liquid passing therethrough, an electric current passing through said metal filter means to said ink liquid passing therethrough only when the imposition of a charge on said ink droplets passing through the charging tunnel is synchronized with the formation of said ink droplets at the nozzle; and

detection circuit means connected to said metal filter means for detecting said electric current flowing in said ink liquid passing through said metal filter means and developing an output signal representative thereof;

said ink jet system printer further including a synchronization system means responsive to said output signal from said detection circuit means for developing an output signal in response thereto,

said output signal from said synchronization circuit means energizing said charging tunnel of said ink droplet issuance unit thereby synchronizing the imposition of a charge on said ink droplets in said charging tunnel with the formation of said ink droplets from said nozzle of said ink droplet issuance unit.

4,288,797

VARIABLE-CHARGE TYPE INK-JET PRINTER

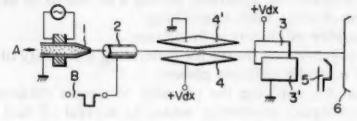
Masanori Horike, Tokyo; Koichiro Jinnai, Kawasaki; Kyuhachiro Iwasaki, Fujisawa, and Yutaka Kodama, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1979, Ser. No. 81,338

Claims priority, application Japan, Nov. 10, 1978, 53-124122

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **9 Claims**



1. A variable-charge type ink-jet printer characterized by the provision of

(a) a print head unit having a nozzle from which an ink jet issues;

(b) a charge electrode means for charging ink drops in response to the print signals;

(c) a pair of X-direction deflection electrodes; and

(d) a pair of Y-direction deflection electrodes orthogonal to said pair of X-direction deflection electrodes, said Y-direction deflection electrodes being inclined with respect to each other so that the distance therebetween increases in the X-direction, so that ink drops which are more highly charged and which therefore undergo greater X-direction deflection, move through a weaker vertical field region of the deflection electrodes, so that the vertical deflection of said drops is made less than what it would otherwise be, whereby the charged ink drops may be deflected both in orthogonal X and Y directions to fly trajectories away from the trajectory of the uncharged ink drops, the deflections in the X-direction of the charged ink drops being varied depending upon the charge imparted to the respective ink drops, the relative inclination of the Y-direction deflection electrodes being such that the Y-direction deflections of said ink drops are the same regardless of the magnitude of the charges imparted to the respective ink drops.

4,288,798

STYLUS CHANGING DEVICE

Walter Hollmayer, Himberg, Austria, assignor to Goerz Electro Gesellschaft m.b.H., Vienna, Austria

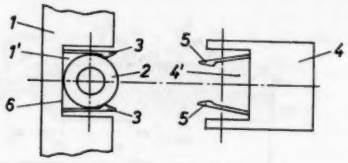
Filed Oct. 4, 1979, Ser. No. 81,916

Int. Cl.³ G01D *15/00*

U.S. Cl. 346—139 R **2 Claims**

1. A stylus changing apparatus for use in automatically controlled drafting machines utilising a plurality of styli comprising a fixed magazine defining a plurality of compartments for receiving styli not instantaneously in use and a displaceable

carriage for the stylus in use, the carriage also defining a compartment for the stylus, wherein each compartment of the magazine and the chamber of the stylus carriage each include a stylus holding device, the holding devices in the compartments being identical and being formed by the rear wall of the compartment defining a fixed stop for the stylus and by two resilient clips, the free ends of which project into the compartment, said free ends each having an inwardly directed projection or barb formed thereon, said projections abutting against a stylus located in the compartment and resisting, in use, motion of said stylus away from said rear wall whereby transfer of a stylus between the magazine and the carriage is effected by displacing the carriage in directions parallel to its co-ordinate axes.

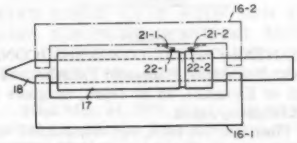


4,288,799

LIQUID JET RECORDING HEAD WITH PERMANENT JIG ALIGNMENT

Shunichi Uzawa, Naka; Shigeyuki Matsumoto; Minoru Miyazaki, both of Kawasaki; Akio Iijima, Yokohama, and Kunio Watanabe, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1980, Ser. No. 148,269
Claims priority, application Japan, May 14, 1979, 54-58977
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **6 Claims**



1. A liquid jet recording head used for a liquid jet recording device conducting recording by projecting a liquid droplet to a predetermined direction which comprises:

recording head elements each of which comprises an inflow port side end portion having an inflow port for the liquid, an ejecting orifice side end portion having an ejecting orifice for ejecting the liquid at the end, a pressure generating portion existing between the inflow port side end portion and the ejecting orifice side end portion and communicating with them, and an electromechanical transducer connected to the pressure generating portion and capable of changing the inner pressure of the liquid in the pressure generating portion; and

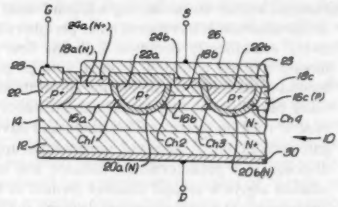
a jig comprising grooves for fixing the recording head elements and electric contacts for applying electric signals to the electromechanical transducer, the recording head element being pressed from two directions to be fixed to the groove and an electric contact being established between the electromechanical transducer and the jig.

4,288,800

JUNCTION FIELD EFFECT TRANSISTOR

Takashi Yoshida; Takeshi Matsuyama; Tamaki Kuki, and Takayuki Kodaka, all of Hamamatsushi, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 845,202, Oct. 25, 1977, Pat. No. 4,181,542.
This application Aug. 6, 1979, Ser. No. 63,829
Int. Cl.³ H01L *29/80*
U.S. Cl. 357—22 **10 Claims**



1. A junction field transistor comprising:

a semiconductor substrate having one principal surface, said substrate including a first semiconductor layer of one conductivity type extending substantially in parallel with said principal surface and a second semiconductor layer of the opposite conductivity type to said one conductivity type formed on said first semiconductor layer and extending substantially in parallel with said principal surface;

a first diffused region of said one conductivity type formed in said second semiconductor layer in accordance with a predetermined channel pattern and reaching said first semiconductor layer;

a second diffused region of said opposite conductivity type formed in said first diffused region to define a channel region of said one conductivity type between said second diffused region and said second semiconductor layer, one end of said channel region being conductively coupled with said first semiconductor layer;

a first main electrode electrically connected to said first semiconductor layer;

a control electrode electrically connected to said second diffused region; and

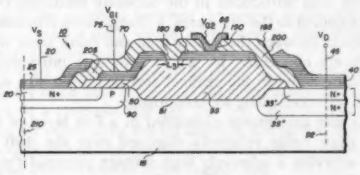
a second main electrode electrically connected to the other end of said channel region on said second semiconductor layer.

4,288,801

MONOLITHIC HVMOSFET ACTIVE SWITCH ARRAY

Ram S. Ronen, Placentia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1979, Ser. No. 43,563
Int. Cl.³ H01L *27/02*
U.S. Cl. 357—41 **9 Claims**



1. A HVMOSFET cascade switch structure having closed geometry in an integrated array on a monolithic substrate with relatively monotonicall decreasing voltage order from the center out, comprising:

(a) first switch means having a first drain area formed in the substrate at its relative center with a relatively high voltage potential applied thereto, having a first source area

formed in the substrate at its relative outer periphery at a predetermined distance and in concentric relation to the first drain, and having a first gate disposed at a predetermined distance and in concentric relation above a first channel formed in the substrate interposably at a predetermined distance and in concentric relation between the relative center and the outer periphery for connection to the first drain area for operation as an active MOS load of the structure relative to the substrate; and

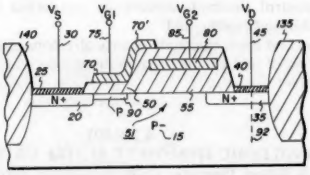
(b) second switch means having a second drain area formed in the substrate at its relative inner periphery that is operatively coincidently common with the first source area, having a fixed common ground voltage potential at a second source area formed in the substrate at the relative outer periphery at a predetermined distance and in concentric relation to the second drain, and having a second gate with a control input voltage potential applied thereto disposed at a predetermined distance and in concentric relation above a second channel formed in the substrate interposably at a predetermined distance and in concentric relation between the relative inner and outer peripheries for controlling the switching of an outputted relatively high voltage potential at the second drain area.

4,288,802

HVMOSFET DRIVER WITH SINGLE-POLY GATE STRUCTURE

Ram S. Ronen, Placentia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 17, 1979, Ser. No. 43,870
Int. Cl.[3] H01L *27/02*
U.S. Cl. 357—41 **18 Claims**



1. A MOSFET component for use as a monolithic integrated array on a substrate having closed geometry including a drain area as a relative center axis introduced in the substrate, a source area introduced in the substrate relatively concentric and adjacent to the drain area, a channel area introduced in the substrate betweer. the source area and drain areas which it is relatively concentric to, and a drift area introduced in the substrate between the channel area and drain area which it is relatively concentric to, comprising:

(a) first gate means embedded in a first layer of relatively thick oxide relatively disposed over the drift area for applying a relatively high voltage potential through the first layer to the drift area for stretching out the field lines away from the drain area; and,

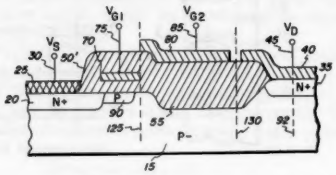
(b) second gate means embedded in a second layer of relatively relative thin oxide relatively disposed over the channel area and introduced as part of the same relatively non-overlapping layer as said first gate means for controlling the potential and for turning on and off the current between the source and drain areas.

4,288,803

HIGH VOLTAGE MOSFET WITH DOPED RING STRUCTURE

Ram S. Ronen, Placentia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 8, 1979, Ser. No. 43,972
Int. Cl.[3] H01L *27/02*
U.S. Cl. 357—41 **25 Claims**



1. A high voltage MOSFET in an integrated monolithic array on a substrate with a closed geometry configuration including a drain area having a relative center axis introduced in the substrate, a source area introduced in the substate relatively adjacent to the drain area, a channel area introduced in the substrate between the source area and the drain area, and a drift area introduced in the substrate between the channel area and the drain area, comprising:

(a) field plate means relatively disposed in a first layer of relatively thick oxide over the drift area for application of a potential through the first layer of thick oxide to the drift area for controlling the breakdown voltage as between the source and drain area by contouring the field lines to bend away from the drain area;

(b) gate electrode means relatively disposed in a second layer or relatively thin field oxide over the channel area for controlling the potential and for turning on and off the potential as between the source and drain areas and;

(c) ring means implanted in the substrate to be relatively aligned with the spatial gaps occurring between said field plate means and said gate electrode means as doped areas for reducing resistance in the spatial gaps by providing a conductive path for carriers as between said gate electrode means and said field plate means.

4,288,804

COMPLEMENTARY METAL-OXIDE SEMICONDUCTOR

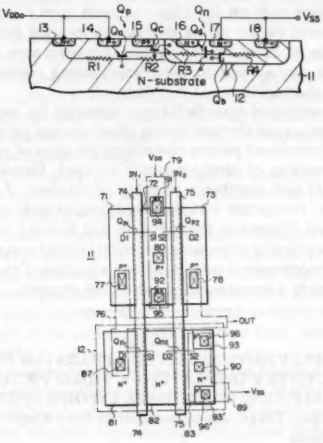
Hideo Kikuchi, Yokohama; Haruyoshi Takaoka, and Shigenori Baba, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 10, 1979, Ser. No. 102,017
Claims priority, application Japan, Dec. 27, 1978, 53/164997
Int. Cl.[3] H01L *27/02*
U.S. Cl. 357—42 **13 Claims**

1. In a field effect transistor device which includes a first portion of a substrate having a first type of conductivity, a second portion of the substrate having a second type of conductivity opposite to the first conductivity type and being contained in the first substrate portion, at least one first channel field-effect transistor formed in the second substrate portion and provided with two first regions each having the first conductivity type which act as the source and the drain thereof, at least one second channel field-effect transistor in the first substrate portion with two second regions each having the second conductivity type which act as the source and the drain thereof, a first voltage supply which applies a first voltage potential to the first substrate portion and to a selected one of said second regions of at least one of said second field-effect transistor(s) and a second voltage supply which applies a second voltage potential to the second substrate portion and to a selected one of said first regions of at least one of said first field-effect transistors, the configuration of selected ones of said two regions of each of said first and second substrate

portions and said first and second substrate portions comprising at least one parasitic bipolar transistor, the improvement comprising:

at least one additional doped portion in a respective selected one of said first and second substrate portions and having the same conductivity type as the respective substrate portion in which it is formed, formed at a position sufficiently close to a respective region of the respective field-effect transistor that is directly connected to the respective voltage supply so as to reduce effectively to zero the resistance biasing the base of said at least one parasitic bipolar transistor that is associated with the respective second region that is directly connected to the respective voltage supply, each said additional doped portion being directly connected to the respective voltage supply.

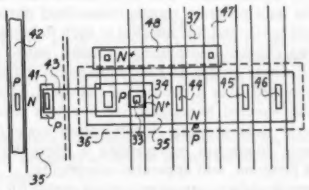


4,288,805

INTEGRATED LOGIC GATE WITH NPN INVERTER, PNP CLAMP, COUPLING SCHOTTKY DIODES AND DIFFUSED CROSSUNDER

Maurice Depey, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 14, 1979, Ser. No. 20,491
Claims priority, application France, Mar. 14, 1978, 78 07279
Int. Cl.³ H01L *27/04*; H03K *19/084, 19/091*
U.S. Cl. 357—44 **18 Claims**



1. A logic element structure suitable for high density integration including:

a first NPN transistor having an emitter coupled to circuit ground, a collector and a base;

a Schottky diode coupled to said collector of said first transistor for providing a logic element output; and

a second PNP anti-saturation transistor having a base coupled to said collector of said first transistor, a collector coupled to circuit ground and an emitter coupled to said base of said first transistor;

said logic element structure being fabricated as a monolithic integration on a semiconductor crystal and comprising:

an isolated region of N-type semiconductor material having a generally rectangular solid shape including inner and outer principal faces and lateral faces, said region being bounded on its inner principal face by a substrate and by a buried layer of N^+-type semiconductor material, said isolated region being bounded on its lateral faces by an insulating wall of P-type semiconductor material and being bounded on its principal outer face by a first region of P-type semiconductor material, this first region of P-type semiconductor material occupying the periphery of the isolated region and partially covering the insulating wall, said isolated region also being bounded on its principal outer face by a second region of P-type semiconductor material insulated from the first region of P-type semiconductor material by a minimum thickness of N-type semiconductor material, this second region of P-type semiconductor material surrounding a second region of N^+-type semiconductor material, and an N^+-type semiconductor region diffused into the insulating wall providing connection to an adjacent logic element

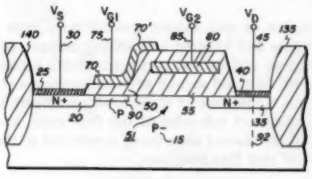
said Schottky diode comprising and being formed by a metallization on the principal outer face of the isolated region between the first and second P-type semiconductor regions.

4,288,806

HIGH VOLTAGE MOSFET WITH OVERLAPPING ELECTRODE STRUCTURE

Ram S. Ronen, Placentia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1979, Ser. No. 43,288
Int. Cl.³ H01L *27/10*
U.S. Cl. 357—45 **20 Claims**



1. A high voltage metal oxide semiconductor structure in an integrated monolithic array on a substrate having closed geometry for implementation as a driver including a drain region having a relative center axis introduced in the substrate adjacent to the drain region, a source area introduced in the substrate relatively adjacent to the drain area, a channel region introduced in the substrate between the source region and the drain regions, and a drift region introduced in the substrate between the channel region and the drain region, comprising:

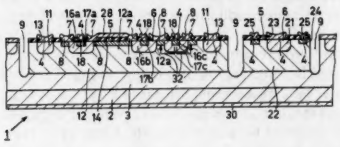
(a) field plate means relatively disposed in a first layer of relatively thick field oxide over the drift region, for application of a potential through the first layer to the drift region for controlling the breakdown voltage as between the source and device regions by contouring the field lines to bend away from the drain region; and

(b) gate electrode means relatively disposed in a second layer of relatively thin field oxide over the channel region and being spatially overlapped by said field plate means for controlling the potential and turning on and off the current between the source and drain regions and for reduction of series resistance generated in the spatial a[illegible] between said field plate means and said gate electrode means that it relatively overlaps.

4,288,807
DARLINGTON CIRCUIT HAVING AN IMPROVED DIODE DRAIN

Theodoor H. Enzlin, Eindhoven, and Antonius J. Janssen, Nijmegen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1979, Ser. No. 24,750
Claims priority, application Netherlands, Apr. 7, 1978, 7803706
Int. Cl.[3] H01L 27/02
U.S. Cl. 357—46 9 Claims



1. A semiconductor device having a Darlington amplifier circuit comprising:

a semiconductor body having first and second bipolar transistors, each comprising an emitter and a collector region of a first conductivity type and an intermediate base region of a second conductivity type opposite to that of the first, the emitter region of said first transistor being connected to the base region of said second transistor;

a diode provided between the base and the emitter regions of said first transistor;

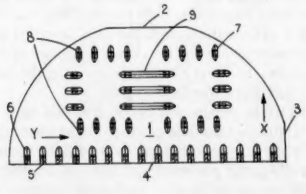
a surface region of said first conductivity type in the base region of the first transistor and electrically connected thereto, said surface region forming a first zone of said diode and said first zone comprising a plurality of juxtaposed sub-zones which are at least partially separated from each other by parts of the base region of the first transistor and are connected to said parts of the base region by a contact layer which extends across the p-n junction between said sub-zones and said parts of the base region;

a second region of said second conductivity type in the surface region and forming a rectifying contact with said surface region, said second region forming a second zone of said diode, and said second zone comprising a plurality of sub-zones, a sub-zone of the second zone being located in each juxtaposed sub-zone of the first zone, and each sub-zone of the second zone being connected to the emitter region of said first transistor.

4,288,808
CIRCUIT STRUCTURES INCLUDING INTEGRATED CIRCUITS

Gerald H. Hantusch, Cheadle, England, assignor to International Computers Limited, London, England

Filed Jan. 23, 1979, Ser. No. 5,918
Claims priority, application United Kingdom, Jan. 28, 1978, 03549/78
Int. Cl.[3] H01L 23/48; H05K 3/30
U.S. Cl. 357—68 9 Claims



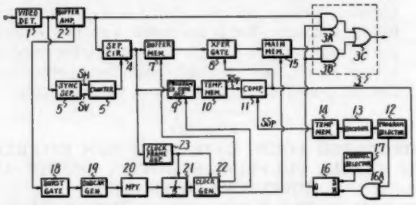
1. A method of manufacturing a circuit structure including integrated circuit comprising the steps of providing a planar member of semi-conductor material; forming on one surface of said member a plurality of recesses of V-section; forming on said one surface a plurality of electrical conductors including contact areas arranged in a predetermined pattern, each contact area having at least a portion thereof lying in one of said recesses; providing an integrated circuit chip of semi-conductor material, the chip carrying on one surface a plurality of raised electrically conductive contact pads arranged in a formation corresponding to said predetermined pattern; aligning the contact pads on the chip one with each corresponding contact area on the planar member by locating each contact pad in the recess of the corresponding contact area; and bonding each contact pad to the corresponding contact area to provide electrical contact therebetween.

3. A method of manufacturing a substrate for mounting an integrated circuit element having raised contact pads arranged in a predetermined pattern comprising the steps of providing a planar member of semi-conductor material; forming on one surface of said member a plurality of recesses of V-section serving to co-operate with the raised contact pads and thereby locate said element on the substrate; and forming on said one surface a plurality of metallic electrical contact areas arranged in said predetermined pattern, at least a portion of each contact area lying in a corresponding one of the recesses.

4,288,809
TELEVISION RECEIVER APPARATUS FOR SELECTIVELY DISPLAYING A VIDEO PICTURE OR ALPHANUMERIC DATA INFORMATION

Toyoji Yabe, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 21, 1980, Ser. No. 152,116
Claims priority, application Japan, May 23, 1979, 54-63527
Int. Cl.[3] H04N 9/32
U.S. Cl. 358—12 24 Claims



23. Television receiver apparatus for receiving and selectively displaying on the display screen of a cathode ray tube a video picture derived from video signals transmitted on a broadcasting channel and having field and horizontal line intervals, or alphanumeric data information derived from alphanumeric data program signals transmitted during at least one selected horizontal line interval in each field interval, said broadcasting channel transmitting a predetermined number of alphanumeric data programs, each alphanumeric data program being transmitted over a number of said field intervals with each of said selected horizontal line intervals containing an alphanumeric data program identification code formed of alphanumeric characters representing a respective alphanumeric data program, said apparatus comprising:

alphanumeric data program separating means for separating said alphanumeric data program signals and said alphanumeric program identification codes from the received broadcasting channel;

addressable memory means having a plurality of addressable storage locations for storing respective ones of said alphanumeric program identification codes;

switch means manually operable to clear the contents of said addressable memory means;

read means, including read address counter means, operative

after the contents of said addressable memory means have been cleared, to address successively each of said storage locations during a predetermined interval so as to read out the contents of each addressed storage location;

comparator means coupled to said separating means and to said addressable memory means to compare each alphanumeric program identification code read out from said addressable memory means to the alphanumeric program identification code then being received by said television receiver apparatus and to produce a comparison signal if the compared codes are equal;

write means, including write address counter means, operative after the contents of all of said storage locations have been read out, to write the alphanumeric program identification code then being received by said television receiver apparatus into the storage location addressed by said write address counter means;

write address pulse generating means for supplying periodic write address pulses to said write address counter means to increment the count thereof;

inhibit means responsive to said comparison signal to inhibit said write means from writing the alphanumeric program identification code then being received by said television receiver apparatus into the storage location addressed by said write address counter means and to inhibit the count of said write address counter means from being incremented;

read only memory (ROM) means having a plurality of sections, each associated with an alphanumeric character and each section having storage locations for storing patterns of data elements representing a respective alphanumeric character;

means for addressing the sections of said ROM means with the alphanumeric characters forming the alphanumeric program identification code read out from said addressable memory means;

means for reading out the patterns of data elements from the storage locations of the addressed section of said ROM means during predetermined portions of successive ones of said horizontal line intervals;

color signal generating means for supplying a predetermined background color signal to said cathode ray tube;

enabling means for enabling said color signal generating means during at least said predetermined portions of a preselected number of horizontal line areas such that an area of background color is displayed on the display screen of said cathode ray tube; and

color control means for controlling said color signal generating means in accordance with said patterns of data elements read out from said ROM means to modify said background color and provide a viewable display of alphanumeric program identification codes.

4,288,810

METHOD OF AND APPARATUS FOR DERIVING A PAL COLOR TELEVISION SIGNAL CORRESPONDING TO ANY DESIRED FIELD IN AN 8-FIELD PAL SEQUENCE FROM ONE STORED FIELD OR PICTURE OF A PAL SIGNAL

John O. Drewery, Coulsdon, and Richard Storey, Sutton, both of England, assignors to British Broadcasting Corporation, London, England

Filed May 29, 1979, Ser. No. 43,540

Claims priority, application United Kingdom, May 30, 1978, 23924/78; May 30, 1978, 23925/78

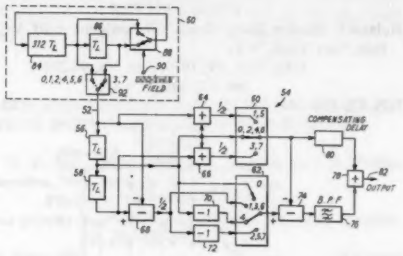
Int. Cl.³ H04N *9/39, 9/535*

U.S. Cl. 358—16 **15 Claims**

1. A method of deriving a PAL colour television signal corresponding to any field in an 8-field PAL sequence from one stored field or picture of a PAL signal, comprising:

providing a first selected combination of signals from more than one line of said stored field to form a first part of said signal containing at least the low-frequency components thereof;

separately providing a second selected combination of signals from more than one line of said stored field to form a second part of said signal containing only chrominance



components thereof such that successive fields have the sub-carrier phase appropriate to the respective successive fields of a PAL signal; and

combining said first and second parts to form said derived signal.

4,288,811

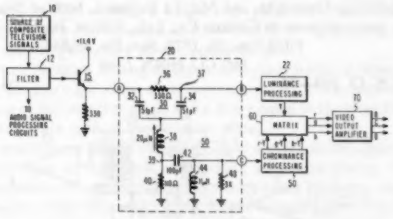
LUMINANCE AND CHROMINANCE SIGNAL SEPARATION NETWORK

Saiprasad V. Naimpally, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,926

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—31 **10 Claims**



1. In a color television receiver including a source of composite video signals containing a luminance component and a chrominance component including modulated color subcarrier, a luminance signal processing channel, and a chrominance signal processing channel, a filter circuit for separating said luminance and chrominance components comprising:

a bridged-T filter network for attenuating said chrominance component at said input of said luminance channel, including

a first signal path coupled between said source of video signals and an input of said luminance channel, said first path including a first reactive impedance;

a second signal path coupled between an intermediate point in said first signal path and a point of reference potential, said second path including a second reactive impedance tuned with said first reactive impedance to the frequency of said color subcarrier and a signal tap between said second reactive impedance and said point of reference potential; and

a bandpass filter with an input coupled to said signal tap and an output coupled to said chrominance channel, said bandpass filter cooperating with said bridged-T filter to selectively pass to said chrominance channel signal frequencies

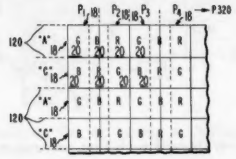
within a range of frequencies occupied by said chrominance component.

4,288,812

COLOR FILTER

Roland N. Rhodes, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 19, 1979, Ser. No. 94,286
Int. Cl.³ H04N 9/09
U.S. Cl. 358—44 **11 Claims**



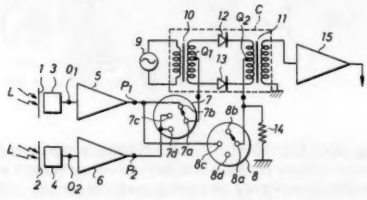
1. A color filter for use with an image pickup device having a plurality of photosensors and a line scan direction, said filter comprising a plurality of horizontally repetitive sets of areas of different colors, all of the areas having a dimension in the direction of said line scan which is less than the corresponding dimension of the photosensors of said pickup device.

4,288,813

APPARATUS FOR AUTOMATICALLY ENGRAVING MIMEOGRAPHIC STENCIL PAPERS

Takehisa Miyashita, and Mujika Fujiwara, both of Tokyo, Japan, assignors to Gakken Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1979, Ser. No. 73,844
Int. Cl.³ H04N 1/46
U.S. Cl. 358—75 **4 Claims**



1. In an apparatus for automatically engraving mimeographic stencil papers including a drum for being wound with an original and stencil papers, a light-receiving portion for reading the contents disclosed in the original and a recording portion for engraving the stencil papers, the improvement which comprises:

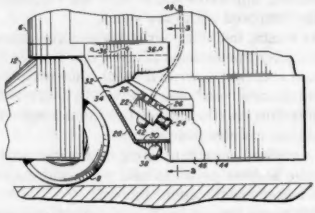
two light-receiving elements having color filters with different spectral characteristics, each element having an output, a comparator circuit for determining the output of the light receiving elements depending upon the magnitude of input voltages into the circuit produced by said light-receiving elements, and a switching means which selectively connects the two outputs of said light-receiving elements to the two inputs of said comparator circuit, such that the contents of every color engraved in the original is decomposed into two colors, one being black and the other any other color.

4,288,814

CLOSED CIRCUIT VIDEO GUIDANCE SYSTEM FOR FARMING VEHICLES AND METHOD

Bruce J. Talley, and Barry G. Tolbert, both of Parker, Ariz., assignors to Talley & Sons, Inc., Parker, Ariz.

Filed Feb. 4, 1980, Ser. No. 117,869
Int. Cl.³ H04N 7/18
U.S. Cl. 358—93 **8 Claims**



1. A guidance system for use in conjunction with a farming vehicle adapted to be driven through a field of crops planted in rows, the crops having relatively dense foliage making it difficult for an operator of the farming vehicle to ascertain the position of the rows, the farming vehicle having a plurality of drive wheels and at least one guide wheel, the farming vehicle also having a steering mechanism for controlling the guide wheel, the steering mechanism allowing an operator to steer the farming vehicle, the farming vehicle having a longitudinal axis corresponding to the direction in which the farming vehicle travels and also having a lateral axis perpendicular to the longitudinal axis, said guidance system comprising in combination:

a. a video camera including a lens, said lens having an optic axis;

b. attaching means for attaching said video camera to the farming vehicle and for positioning said video camera to view an area of the ground lying below the farming vehicle for differentiating the rows in which the crops are planted from furrows formed between such rows, the optic axis of said lens being positioned to lie in a plane perpendicular to the lateral axis of the farming vehicle; and

c. a video monitor attached to the farming vehicle in proximity to the steering mechanism and electrically coupled to said video camera for displaying the area of the ground viewed by said video camera and assisting the operator of the vehicle in ascertaining the position of the rows and furrows formed within the field;

whereby, an operator can steer the farming vehicle in accordance with the information displayed by said video monitor in order to maintain the guide wheel and the plurality of drive wheels within the furrows.

4,288,815

VIDEO PICTURE PROCESSING INCLUDING MOVEMENT DETECTION

Barry D. R. Miles, Newbury, England, assignor to Quantel Limited, Berkshire, England

Filed Mar. 14, 1980, Ser. No. 130,356
Claims priority, application United Kingdom, Mar. 22, 1979, 10114/79
Int. Cl.³ H04N 7/18
U.S. Cl. 358—105 **14 Claims**

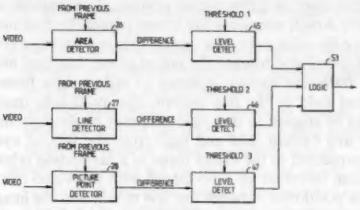
1. A video detector system for detecting picture movement and/or noise on a video signal, said detector system including:

first detector means for detecting differences frame by frame on a portion of picture having a plurality of picture points from more than one line;

second detector means for detecting differences frame by

frame on a portion of picture having a plurality of picture points from the same line;

third detector means for detecting differences frame by frame on a portion of picture comprising a single picture point, and

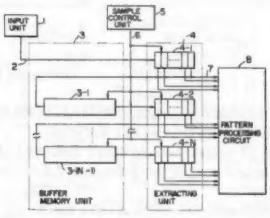


output means for receiving an output from said first, second and third detectors to determine that movement has occured in dependence on the outputs from said first, second and third detector means.

4,288,816
COMPRESSED IMAGE PRODUCING SYSTEM

Seiji Kashioka, Hachioji; Yoshihiro Shima, Kokubunji; Takafumi Miyatake, Tokorozawa, all of Japan; Masakazu Ejiri, San Jose, Calif., and Osamu Obata, Takasaki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 17, 1978, Ser. No. 897,133
Claims priority, application Japan, Apr. 18, 1977, 52-43554
Int. Cl.³ H04N *7/12*
U.S. Cl. 358—138 **6 Claims**



1. A compressed image producing system comprising:

a first means for successively scanning a two-dimensional image to convert the image information on the respective scanning lines into picture element signals in synchronism with reference clock pulses;

second means operated by first sampling instruction pulses for the temporary storage of said image signals including a plurality of stages of information storages connected so that said image signals supplied from said first means to a first stage of the information storages are sequentially shifted to following stages of the information storages;

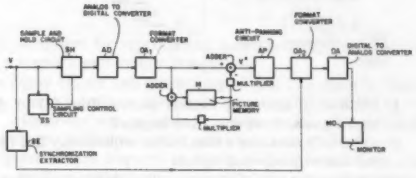
third means operated by second sampling instruction pulses for construction of partial images including a plurality of shift registers provided corresponding to said information storages, said shift registers taking in said image signals from the corresponding information storages in accordance with the input order thereof to parallelly deliver plural-bit image signals; and

fourth means for generating said reference clock pulses, said first sampling instruction pulses which control said second means so that said image signals from said first means are sampled through predetermined scanning lines for the supplying thereof to said second means and said second sampling instruction pulses which control said third means so that said image signals from said second means are sporadically sampled at a predetermined interval for the supplying thereof to said third means, said fourth means including a control circuit for shifting the timing of the generation of at least one of said first and second sampling instruction pulses in timing with the end of the image scanning operation performed by said first means, whereby for the scannings repeatedly performed on the same image, the image signals relating to the sampled picture elements different from those in the previous scanning are supplied to said third means.

4,288,817
METHOD AND A DEVICE FOR ELIMINATING FIXED ERROR DISTURBANCES IN A PYROELECTRIC VIDICON

Anders N. E. Igel, Jarfalla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1979, Ser. No. 31,267
Claims priority, application Sweden, Apr. 26, 1978, 7804820
Int. Cl.³ H04N *5/14, 5/34*
U.S. Cl. 358—163 **14 Claims**



3. A device for eliminating disturbances from fixed error sources in a video signal from an infrared camera of the pyroelectric vidicon type in which a heat picture is projected onto a pyroelectric detector plate, the plate is scanned by means of a beam of electrons for producing the video signal containing information about variations in the heat picture on the plate, and a stationary heat picture is converted to a variable heat picture on the plate, said device comprising:

a picture memory having an input, an output signal, a capacity for storing a video signal corresponding to a complete scan of the detector plate, and a delay equal to the time for a complete scan of the detector plate;

first multiplying means having an input and an output signal, said input of said first multiplying means receiving, in operation, the output signal from the picture memory, said output of said first multiplying means being a signal which is, in operation, the output signal of the picture memory multipled by a factor, K, which is less than but nearly equal to one;

first adding means having inputs and an output signal, said inputs of said first adding means receiving, in operation, the instantaneous value of the video signal at each moment and the output signal from the first multiplying means, said output of said first adding means being a signal which is the sum of its input signals and which is applied to the input of the picture memory;

second multiplying means having an input and an output signal, said input of said second multiplying means receiving, in operation, the output signal from the picture memory, said output of said second multiplying means being a signal which is, in operation, the output signal from the picture memory multiplied by a reduction factor which is substantially less than one; and

second adding means having inputs and an output signal, said input of said second adding means receiving, in operation, the instantaneous value of the video signal at each moment and the output signal from the second multiplying means, said output of said second adding means being a corrected video signal which is the difference between its input signals.

4,288,818

METHOD AND SYSTEM TO SCAN MOTION PICTURE FILM TO DEVELOP TELEVISION SIGNALS

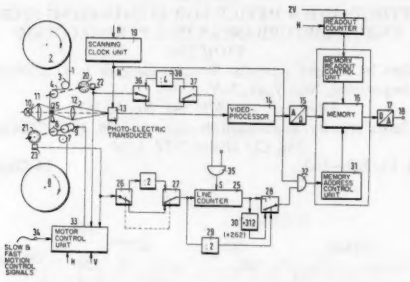
Dieter Poetsch, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 928,783

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1977, 2735685

Int. Cl.³ H04N *3/36*

U.S. Cl. 358—214 **25 Claims**



1. Method of scanning motion picture film (**1**) to derive television signals, comprising the steps of

continuously scanning a film frame, sequentially line by line, and deriving scanned signals;

controlling the rate of scanning of a line in accordance with a repetition rate artifically distorted with respect to television scanning standards to compensate, selectively, for anamorphically distorted images on the film, or varying width of film frame bars;

storing data represented by said scanned signals in a memory (**16**);

reading-out the data stored in a memory in accordance with television scanning standards;

and assigning the lines being scanned individual line addresses which are representative of the position of the scanned line in the film frame, said storing step including storing the signals in the memory, line by line, at said assigned addresses.

4,288,819

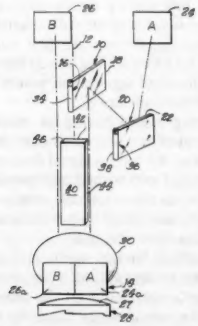
MULTI-FIELD IMAGING DEVICE

Robert T. Williams, 404 South Ardmore, Villa Park, Ill.

Filed May 10, 1979, Ser. No. 37,836

Int. Cl.³ H04N *5/25*; G02B *27/10*

U.S. Cl. 358—226 **5 Claims**



1. A multi-field imaging device for directing light from a first optical field and a separated second optical field into a video camera used for security surveillance thereby reproducing a split-screen image with the video camera, the multi-field imaging device comprising: means for positioning an image plane a predetermined distance from a lens of the video camera whereby images directed on the image plane are reproduced by the video camera; a first mirror positioned on one side of an optical axis which intersects the image plane, the first mirror having an edge adjacent to the optical axis and having a reflective surface oriented toward the image plane; a second mirror having a reflecting surface oriented to reflect light from the first optical field to the first mirror, the multi-field imaging device can be aligned so that light reflected by the first mirror from the first optical field and light from the second optical field are projected to the image plane in a juxtaposed relationship and can therefore be reproduced with the video camera; lens means positioned between the first mirror and the imaging plane for focusing images of the first optical field and the separated second optical field in the image plane; and a mask located between the lens means and the first mirror and aligned approximately along the optical axis for producing a distinct line of demarcation between the images as reproduced by the video camera.

4,288,820

TIME-AXIS PICTURE-SIGNAL CONVERTER FOR FACSIMILE AND THE LIKE

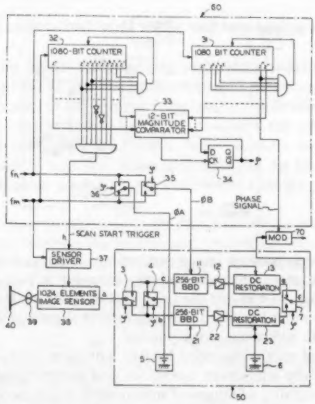
Seisaku Minamibayashi; Takashi Ishikawa, and Takashi Ogawa, all of Tokyo, Japan, assignors to Nippon Electric Co. Ltd., Tokyo, Japan

Filed May 23, 1980, Ser. No. 152,781

Claims priority, application Japan, May 24, 1979, 54/64254

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—280 **3 Claims**



1. A time-axis converter for a facsimile or the like appartus of the type in which a high-speed analog picture signal from a solid-state image sensor consisting of a succession of one-line segments each including a blanking period is converted by means of an analog memory device into an analog picture signal of one-scan line suited to the transmission rate of the circuit line, said converter being characterized in that it comprises:

first clock means for producing a high-speed clock of the rate corresponding to the picture-signal output rate of the solid-state image sensor;

second clock means for producing a low-speed clock of the rate corresponding to the transmission rate of the circuit line;

first counter means for counting the high-speed clock pulses from said first clock means and adapted to be reset at a specified full count;

second counter means for counting the low-speed clock pulses from said second clock means and adapted to be reset at the same full count as that of said first counter means;

means for producing a switching signal each time the output indications of said first and second counter means coincide with each other;

a pair of analog memory devices having a predetermined number of memory elements for delaying and expanding said high-speed analog picture signal;

means for distributing said high-speed picture signal alternately to one and the other of said analog memory devices under the control of said switching signal;

means for reading out the output signal of said analog memory devices alternately under the control of said switching signal as the distribution of said high-speed picture signal to one or the other of said analog memory devices is interrupted; and

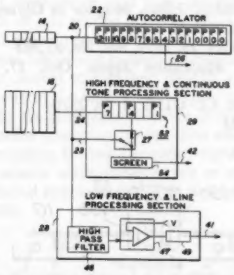
shift-pulse feeding means coupled to each of said analog memory devices for shifting the contents of the memory elements of the analog memory device alternately at the rates of the high-speed and low-speed clocks, the switching between the high-speed and low-speed clocks being effected under the control of said switching signal from the high-speed to the low-speed clock each time the supply of said high-speed picture signal to the analog memory device is started and from the low-speed to the high-speed clock each time such signal supply to the analog memory device is interrupted.

4,288,821

MULTI-RESOLUTION IMAGE SIGNAL PROCESSING APPARATUS AND METHOD

Pierre A. Lavallee, Penfield, and James C. Stoffel, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1980, Ser. No. 155,269
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—293 **30 Claims**



1. In an apparatus for processing image signals derived by raster scanning document originals, having reduced image signal buffer requirements, the combination of:

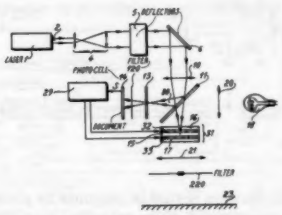
first and second linear scanning arrays, the image resolution of said first array being greater than the image resolution of said second array to provide image signals of different image content without resort to buffer storage.

4,288,822

SYSTEM FOR THE ANALYSIS AND THE RECORDING OF MONOCHROMIC IMAGES

Michel Hareng; Serge Le Berre, and Pierre Leclerc, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 943,819, Sep. 19, 1978, abandoned. This application Mar. 21, 1980, Ser. No. 132,643
Claims priority, application France, Sep. 23, 1977, 77 28739
Int. Cl.³ H09N *1/22*
U.S. Cl. 358—296 **6 Claims**



1. A system for reproducing monochromic images carried by a support; said system comprising:

a liquid crystal cell comprising a layer of a material having a smectic phase; said layer being enclosed between two electrodes and maintained in said smectic phase;

only one radiation source providing a single beam;

optical means, disposed on the path of said beam, for producing from said beam an analyzing light spot on said support and a recording light spot in said liquid crystal cell; at least one of said electrodes being transparent for the wavelength of said beam;

deflecting means, inserted in said path between said radiation source and said optical means, for the scanning of said support by said analyzing spot and the synchronous scanning of said liquid crystal cell by said recording spot;

photodetecting means, for collecting the light emerging from said support and providing an electrical signal representative of said images;

electronic means, receiving said electrical signal and supplying an electrical field between said two electrodes, for controlling the diffusing power of said layer; said diffusing power being created by a local heating of said liquid crystal induced by said recording spot.

4,288,823

APPARATUS FOR AND METHOD OF DISTINGUISHING PAUSES TO CONTROL SELECTIVE REPLAY IN TAPE RECORDING/REPRODUCTION SYSTEMS

Ryuji Yamamoto, Kitasoma; Fukumori Nakahara, Tokyo, and Tadao Kasai, Koshigaya, all of Japan, assignors to Soundesign Corporation, Jersey City, N.J.

Filed Mar. 25, 1980, Ser. No. 133,731
Claims priority, application Japan, Mar. 28, 1979, 54-35644
Int. Cl.³ G11B *15/16, 15/18, 27/22*
U.S. Cl. 360—73 **24 Claims**

1. In a recording/reproduction system for selectively replaying features recorded on a recording medium, and for advancing the recording medium at any one of a selected playback speed, fast forward speed and rewind speed,

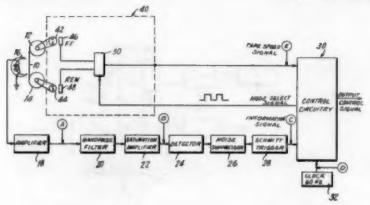
an apparatus for reliably distinguishing between inter-feature pauses between features and intra-feature pauses during features to control the selective replay of the recorded features, said apparatus comprising:

(a) recording medium sensor means for detecting the features and the pauses on the recording medium, and for generating therefrom an information signal indicative of the time duration of each detected pause;

(b) speed sensor means for detecting the advancement speed of the recording medium, and for generating therefrom a

tape speed signal indicative of the speed of the recording medium throughout the advancement thereof;

(c) time-updating means for establishing an initial decision period of predetermined time duration against which the time duration of each detected pause can be compared for distinguishing between inter-feature pauses and intra-feature pauses, and for thereupon changing, in response to the generated tape speed signal, the time duration of the



initial decision period in response to changes in the advancement speed of the recording medium; and

(d) control output means for comparing the time duration of each detected pause with the time duration of the updated decision period to distinguish between inter-feature pauses and intra-feature pauses at all advancement speeds, and for generating therefrom an output control signal to control the selective replay of the recorded features in response to detection of an inter-feature pause.

4,288,824

DEFLECTABLE TRANSDUCER MOUNTING WITH DAMPER FOR VIDEO SIGNAL REPRODUCING APPARATUS

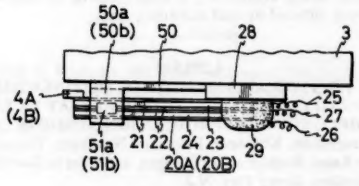
Yoshimi Watanabe, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 911,832, Jun. 2, 1978, Pat. No. 4,165,521, which is a continuation of Ser. No. 731,763, Oct. 12, 1976, abandoned. This application Mar. 21, 1979, Ser. No. 22,870

Claims priority, application Japan, Oct. 14, 1975, 50-123638

Int. Cl.³ G11B *21/18*

U.S. Cl. 360—75 **3 Claims**



1. A system for reproducing a video signal recorded in successive parallel tracks on a recording medium, said system comprising:

rotary support means, bi-morph leaf means, mounting means securing one end portion of said bi-morph leaf means to said rotary support means with said bi-morph leaf means being cantilevered therefrom so as to be movable by flexing from a rest condition in either direction transverse to the direction of said tracks, signal reproducing means for reproducing a video signal in a respective one of said tracks and being connected with the other end portion of said bi-morph leaf means so as to be movable therewith, and damper means in addition to said mounting means and being engageable with said other end portion of said bi-morph leaf means at a distance along the latter spaced from said mounting means for damping free oscillations of said bi-morph leaf means due to bending forces applied to said bi-morph leaf means.

4,288,825

MAGNETIC CARD HANDLING APPARATUS

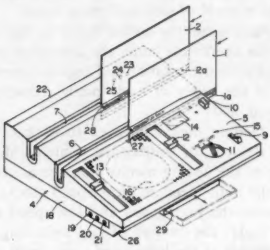
Masatoshi Hasuo, Yokohama, and Jungo Tsuji, Yachiyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 5, 1979, Ser. No. 54,799

Claims priority, application Japan, Jul. 7, 1978, 53-82759

Int. Cl.³ G11B *19/02*

U.S. Cl. 360—88 **26 Claims**



1. A magnetic card handling apparatus for handling a magnetic card having at least an end, an edge and a thickness; comprising:

at least one card running groove for receiving said edge of said magnetic card;

a magnetic head adjacent one side of said groove;

a rotatable capstan adjacent the other side of said card running groove opposed to said magnetic head;

means for spacing said magnetic head and said rotatable capstan apart a first distance exceeding said thickness of said magnetic card;

detecting means for detecting the presence of said magnetic card between said magnetic head and said rotatable capstan; and

means responsive to said detecting means for decreasing the distance between said magnetic head and said rotatable capstan to a second distance smaller than said first distance whereby said magnetic card is pinched between said magnetic head and said rotatable capstan so as to be driven by the latter.

4,288,826

PAD DEVICE FOR USE IN TAPE CASSETTE

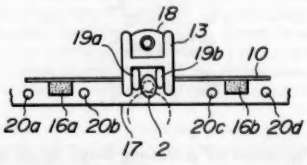
Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Oct. 25, 1979, Ser. No. 87,963

Claims priority, application Japan, Oct. 27, 1978, 53-148082[U]

Int. Cl.³ G11B *15/60, 23/04*

U.S. Cl. 360—130.33 **5 Claims**



1. In a tape cassette having a cassette casing with magnetic tape therein, a capstan shaft hole provided in said casing, magnetic head insertion windows provided at least on both sides of said capstan shaft hole and tape pad means including tape pad members located to urge said magnetic tape against

magnetic heads inserted in said insertion windows, the improvement comprising a tape pad support assembly consisting essentially of a support member including a pair of legs juxtaposed on opposite sides of said capstan shaft hole and arranged to receive a capstan shaft therebetween, a pair of separated independent spring members each mounted, respectively, in one of said legs to extend in opposed directions over said insertion windows having said tape pad members mounted thereon, and means operatively supporting said support member in said cassette with said tape pads adjacent said insertion windows.

4,288,827

AUTOMATIC SWITCHING DEVICE FOR CASSETTE TAPE RECORDER WITH LOW FREQUENCY COMPENSATING MEANS

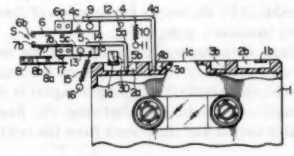
Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Division of Ser. No. 841,758, Oct. 13, 1977, Pat. No. 4,158,865, which is a continuation of Ser. No. 645,458, Dec. 30, 1975, abandoned. This application Apr. 9, 1979, Ser. No. 28,095

Claims priority, application Japan, Jan. 24, 1975, 50-11244[U]; Jan. 24, 1975, 50-11245[U]; Jan. 31, 1975, 50-13564; Jan. 31, 1975, 50-15146[U]; Feb. 19, 1975, 50-23005[U]; Feb. 20, 1975, 50-21648

Int. Cl.[2] G11B *15/06, 15/49*

U.S. Cl. 360—137 **13 Claims**



1. An automatic switching device for use in a cassette tape recorder adapted to receive a tape cassette and including a tape head, the switching device comprising:

tape erasure prevention means including means for detecting the removal of a lug covering an erasure prevention aperture in said tape cassette;

first means for detecting the presence or absence of a first aperture in said tape cassette, the presence or absence of said first aperture being representative of the relative coercivity of the magnetic tape housed by said cassette;

second means for detecting the presence or absence of a second aperture in said tape cassette, the presence or absence of said second aperture being representative of a desired running speed;

third means responsive to said first means for controlling the biasing current to said tape head in accordance with the coercivity of the tape housed in said tape cassette as indicated by the presence or absence of said first aperture; and

fourth means responsive to said first and second means for compensating for low frequency signals recorded on said tape cassette when the presence or absence of said first and second apertures indicates that such compensation is desirable.

4,288,828

PROTECTION SYSTEM FOR ELECTRIC MOTORS

Richard J. Kuntner, Milwaukee, and James C. Vander Meer, Brookfield, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 17, 1980, Ser. No. 113,008

Int. Cl.[3] H02H *7/08, 7/093*

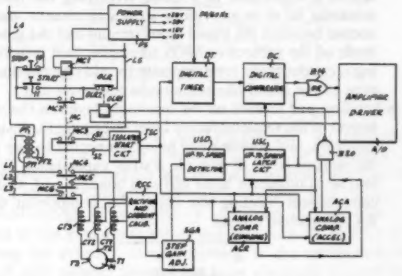
U.S. Cl. 361—31 **14 Claims**

1. In an overload protection system for an electric motor which is connectable to an electric supply source by electroresponsive means, the combination with an electroresponsive relay which when energized causes said electroresponsive means to disconnect said motor from said supply source, of

(a) means providing a control signal which varies in accordance with current drawn by said motor,

(b) means responsive to connection of the motor to said supply source to provide a timed output signal upon elapse of a preset timed interval,

(c) current overload responsive means activated by connection of said motor to said supply source to be responsive to a predetermined value of said control signal of said first mentioned means to provide an overload output signal,



(d) second current overload responsive means responsive when activated to provide another overload output signal whenever said control signal of said first mentioned means exceeds another predetermined value,

(e) means responsive to said motor attaining a predetermined running speed for deactivating said means providing said timed output signal and said first mentioned current overload responsive means, and for activating said second overload responsive means, and

(f) means responsive alternatively to said timed output signal, or either of the first mentioned or said other overload control signals to energize said electroresponsive relay.

4,288,829

PROTECTIVE CIRCUIT ON INSULATING SUBSTRATE FOR PROTECTING MOS INTEGRATED CIRCUIT

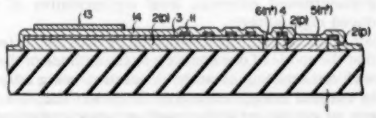
Hiroyuki Tango, Yokohama, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Continuation of Ser. No. 768,849, Feb. 15, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 951,304

Claims priority, application Japan, Feb. 18, 1976, 51-15816

Int. Cl.[3] H02H *3/20*

U.S. Cl. 361—56 **6 Claims**



1. In a protective circuit for a MOS integrated circuit comprising a MOS IC body including at least one MOS transistor at an input stage of a MOS integrated circuit, the at least one input stage transistor being made of an island-like semiconductor layer formed on an insulating substrate and having source, drain and gate electrodes; and

the improvement wherein the protective circuit is formed on the insulating substrate of the MOS IC body for protecting the MOS integrated circuit, the protective circuit comprising:

an R-C protective circuit connected between a signal input

terminal and a gate electrode of the at least one MOS input stage transistor and comprising a protective MOS transistor made of a first region of an island-like semiconductor layer of one conductivity type on an insulating substrate and having source, drain and gate electrodes, said protective MOS transistor being connected between ground and the gate electrode of the at least one MOS input stage transistor, the source electrode of said protective MOS transistor being connected to ground and the drain electrode of said protective MOS transistor being connected to the gate electrode of the at least one MOS input stage transistor;

a sinuous resistor being formed on an insulating layer on a second region of the island-like semiconductor layer which is connected to ground, overlying the insulating substrate so as to provide a stray capacitance and connected between the signal input terminl and the gate electrode of the protective MOS transistor, said resistor having a conductivity type opposite to said one conductivity type of the island-like semiconductor layer; and

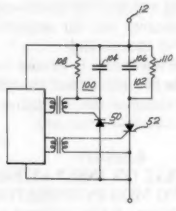
a bonding pad formed on the insulating layer on the second region of the semiconductor layer overlying the insulating substrate, said bonding pad being connected to one end of the resistor so as to provide a stray capacitance between said semiconductor layer and said bonding pad, said stray capacitances forming the capacitive component of said R-C protective circuit.

4,288,830

OVERVOLTAGE PROTECTOR

Robert G. Brasfield, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 16, 1979, Ser. No. 30,487
Int. Cl.³ H02H *3/20*
U.S. Cl. 361—56 **1 Claim**



1. An overvoltage protector adapted to be coupled across the terminals of a power line, which power line normally carries a nominal AC voltage and is subject to induced high voltages exceeding the AC voltages, the protector comprising:

voltage sensing means for sensing the voltage on the line and generating a trigger signal upon said voltage exceeding a predetermined reference level representative of an induced high voltage;

a pair of silicon controlled switching devices connected such that the anode of one connects to the cathode of the other with the resulting common connection being adapted to be coupled to one terminal of the power line; and

a pair of circuit networks, each network comprised of a predetermined value bleeder resistor in parallel with a predetermined value capacitor, each network connected at one end to one of said silicon controlled devices with the remaining end of each network adapted to be coupled to the remaining terminal of the power line,

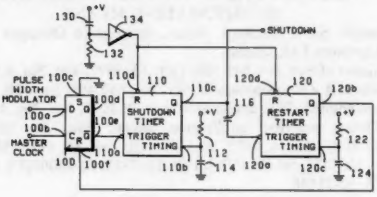
said voltage sensing means, silicon controlled switching devices and circuit networks cooperating such that an overvoltage of a first polarity on the power line is suppressed through the operation of one of said silicon controlled switching devices and its associated circuit network whereas an overvoltage of an opposite polarity on the power line is suppressed through the operation of the other silicon controlled switching device and its associated circuit network, thereby preventing an excessive voltage buildup across, and peak currents through either of said capacitors.

4,288,831

SHUTDOWN CIRCUIT FOR A SWITCHING POWER SUPPLY

Arman V. Dolikian, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 881,309, Feb. 27, 1978, abandoned.
This application Dec. 12, 1979, Ser. No. 102,683
Int. Cl.³ H02H *7/12*
U.S. Cl. 361—92 **3 Claims**



1. A shutdown circuit for a switching type power supply having a fixed reference oscillator with an output wherein the voltage produced by the supply is a function of the output from a controlled oscillator, comprising:

low voltage sense means for comparing the output of the controlled oscillator to the output of the fixed reference oscillator, and generating an inhibit signal in response to a predetermined relationship between the fixed reference oscillator output and the output from the controlled oscillator;

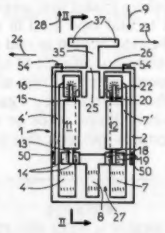
shutdown timer means coupled to the low voltage sense means for inhibiting operation of the power supply for a predetermined time interval in response to said inhibit signal.

4,288,832

TWO-SECTION PROTECTION MODULE FOR CONNECTING BLOCKS

Yves Saligny, Cluses, France, assignor to Etablissements Carpano & Pons, France

Filed May 14, 1979, Ser. No. 38,848
Claims priority, application France, Jun. 9, 1978, 78 18477
Int. Cl.³ H01H *39/00*
U.S. Cl. 361—119 **13 Claims**



1. A protection module for connecting blocks, notably of telephone systems, intended for at least one line wire, said device comprising a case made at least in part of insulating material and having first and second ends, a pair of first and second conducting terminals for each line wire and a ground conducting terminal at said first end of said case in position to

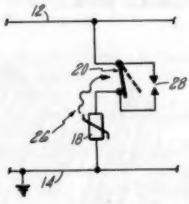
be plugged in in the same direction and to cooperate with corresponding terminals of the connecting block, said first and second conducting terminals having conducting extensions extending toward said second end of said case and having resilient end portions biased toward one another, a protection device for each line wire disposed in said case and having at one end a first terminal electrically connected with said ground terminal and, at an opposite end, a second terminal gripped resiliently between said resilient end portions of said first and second conducting terminals in direct contact therewith, said case having in said second end an orifice opening to said second terminal of said protection device and said resilient end portions of said conducting terminals, and a detachable element of a size and shape for insertion through said orifice to an inner position for cooperation with said second terminal of said protection device and said resilient end portions of said conducting terminals, said detachable element being detachable from said module by withdrawing it from said orifice and replaceable by a different detachable element.

4,288,833

LIGHTNING ARRESTOR

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Dec. 17, 1979, Ser. No. 103,962
Int. Cl.³ H02H 9/04
U.S. Cl. 361—124 **13 Claims**



1. A lightning arrestor comprising, in combination:

A. a voltage-dependent resistor having terminals for electrical connection between a line conductor of a power distribution circuit and ground;

B. normally closed thermostatic switch means electrically connected in series with said resistor, said switch means being thermally coupled with said resistor such that heat generated by said resistor in response to excessive leakage current flowing therethrough under normal line voltage conditions causes said switch means to open and thereby interrupt the flow of said excessive leakage current; and

C. a spark gap electrically connected in series with said resistor by the opening of said switch means, said spark gap preventing the flow of said excessive leakage current through said resistor and having a predetermined breakdown voltage such as to provide effective distribution circuit overvoltage protection, said resistor acting to dissipate the energy associated with line voltage surges in excess of said breakdown voltage and to insure deionization of said spark gap as each line voltage surge subsides.

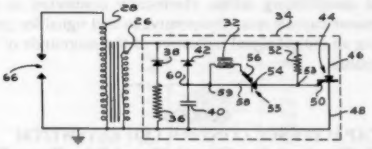
4,288,834

BREAKERLESS MAGNETO IGNITION

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Apr. 9, 1979, Ser. No. 28,724
Int. Cl.³ F02P 3/06
U.S. Cl. 361—256 **4 Claims**

1. Breakerless magneto ignition system including a magnetic pole carrying rotor and a stator having a ferromagnetic core with primary and secondary ignition coil windings disposed on said core, said ignition system comprising a trigger coil circumferentially spaced from a leg of said core in the direction of rotation of said rotor a distance approximately equal to the edge distance of the magneto, a gate turn-off silicon controlled rectifier having anode, cathode and gate electrodes, a capacitor connected in circuit with said primary winding to be charged by electrical pulses of one polarity generated in said primary winding, circuit means connecting the gate of said rectifier with said capacitor, said circuit means including a solid state electronic switching device having cathode and anode electrodes in series with said capacitor and the gate of said rectifier, said device also including a control electrode



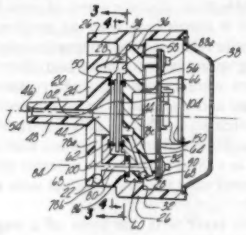
electrically connected with said trigger coil for receiving pulses of electrical energy generated in response to rotation of said magneto for switching said device to its conductive mode through its anode-cathode electrodes whereby said charge of electrical energy of one polarity stored on said capacitor is applied to the gate electrode of said gate turn-off rectifier for shunting the primary current flowing in the anode-cathode path of said rectifier through the gate electrode toward the charged capacitor causing said rectifier to be turned off, thereby opening the circuit of the primary winding to induce an ignition voltage pulse in said secondary winding.

4,288,835

PRESSURE SENSOR

Chen Yi Lee; Charles Tung-ming Wu, both of Troy; Mark A. Brooks, Sterling Heights, and Robert E. Fallis, Milford, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 16, 1979, Ser. No. 30,589
Int. Cl.³ H01G 7/00
U.S. Cl. 361—283 **20 Claims**



1. A pressure sensor comprising:

a pressure capsule means for generating a signal indicative of the pressure of the environment applied thereto, having parallelly situated and separated first and second pressure receiving surfaces, each surface having a pressure responsive region thereon which deflect in response to said pressure of the environment to be sensed; said pressure receiving surfaces being spaced by a ring of dielectric material wherein the areas of said surfaces interior to said dielectric ring correspond to said pressure responsive regions; said capsule further including electrical contacts located outside of said dielectric ring;

housing means for enclosing said pressure capsule within a pressure receiving cavity located therein, said housing means having port means in fluid communication between

said environment and said pressure receiving cavity for communicating said pressure thereto;

support means located within said pressure receiving cavity interposing said housing and said first and said second pressure receiving surfaces;

for compressive loading said capsule wherein the loading forces imparted to each of said pressure responsive regions are directed through said directly ring;

transfer port means located within said housing means for communicating said environment to be sensed to both of said pressure responsive regions;

signal conditioning means electrically connected to said pressure capsule means responsive to said signal for generating an output signal indicative of the magnitude of said pressure.

4,288,836

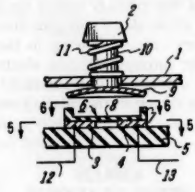
CAPACITANCE CONTROLLED KEYSWITCH

David D. Thornburg, Los Altos, Calif., and Brian Rosen, Pittsburgh, Pa., assignors to Xerox Corporation, Stamford, Conn.

Filed May 29, 1979, Ser. No. 43,519

Int. Cl.³ H01G 5/16

U.S. Cl. 361—288 **3 Claims**



1. In a capacitance controlled keyswitch including a substrate, a pair of spaced coplanar capacitor plates overlying said substrate and a dielectric layer overlying said spaced capacitor plates, the improvement comprising:

a deformable electrode mounted for movement toward and away from said capacitor plates,

means to enable three discrete states of switch operation to be selected in accordance with the position of said movable electrode relative to said capacitor plates said means comprising an actuator tc move said electrode to a first switch state wherein said electrode remains in its undeformed state and is spaced from said dielectric layer, to a second switch state wherein said electrode remains substantially undeformed and is in contact with said dielectric layer, and to a third switch state wherein said electrode is in a deformed state and is in contact with said dielectric layer, and

said dielectric layer is in the form of a stepped member comprising a thin central layer and a thicker peripheral annulus, wherein said deformable electrode contacts said dielectric layer on said peripheral annulus.

4,288,837

ELECTRICAL CAPACITOR

Mineaki Nishimatsu; Sadayoshi Mukai; Yoshinori Hayashi; Osamu Yamaguchi, all c/o Nissin Electric Co., Ltd., 47, Umezu Takase-cho, Ukyo-ku, Kyoto; Akira Ito, 8, Daimachi, Ichigaya, Shinjuku-ku, Tokyo, and Yasutoshi Hara, 5-2, Utsugisaki, Nishikimachi, Iwaki, Fukushima, all of Japan

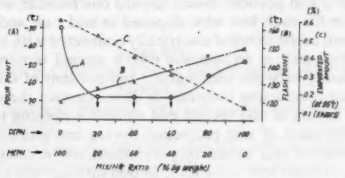
Continuation of Ser. No. 871,691, Jan. 23, 1978, abandoned. This application Jul. 23, 1979, Ser. No. 59,953

Claims priority, application Japan, Jan. 24, 1977, 52-007169

Int. Cl.³ H01G 4/22

U.S. Cl. 361—315 **13 Claims**

1. An electrical capacitor comprising a capacitor element impregnated with an impregnating oil consisting essentially of a mixture of di-iso-propyl naphthalene (DIPN) and mono-iso-



propyl naphthalene (MIPN), said mono-iso-propyl naphthalene being 10% to 80% by weight of said mixture.

4,288,838

ELECTRICAL SIGNAL TRANSMISSION EQUIPMENT BAY

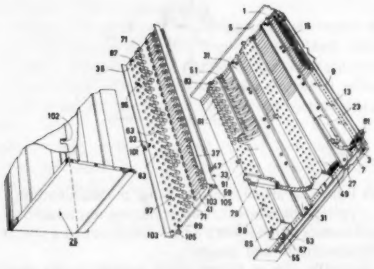
Jan Van Der Vegte, and Dirk G. Hek, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 18, 1979, Ser. No. 58,580

Claims priority, application Netherlands, Aug. 24, 1978, 7808721

Int. Cl.³ H05K 7/10

U.S. Cl. 361—383 **8 Claims**



1. An electrical signal transmission equipment bay comprising two parallel supporting beams having cable guide beams extending directly transversely of the supporting beams said cable guide beams being situated in the first vertical plane, and having cables, going into and out of the bay which are guided along the cable guide beams, said cables extending mainly parallel to said supporting beams inside the bay, the ends of a number of said cables being provided with a plurality of row connectors electrically connected to a plurality of plug-in signal processing boards, each of said plug-in signal boards positioned in one of a plurality of functional units situated in said bay, a plurality of positioning plates each one connected to a respective functional unit, successive first row connectors being situated on a positioning plate for a respective functional unit, a master printed wiring board which is connected to one of said positioning plates, and second row connectors which are connected to said one positioning plate and into which a signal processing board is plugged, wherein said supporting beams are provided with at least one mounting beam which extends transversely to the supporting beams and on which are positioned a number of coaxial connectors each connected to the end of one of said cables, said coaxial connectors cooperating, via a number of openings in a respective positioning plate, with a number of mating coaxial connectors which are provided on said signal processing boards in a respective functional unit, said at least one mounting beam being adapted for detachable suspension from said supporting beams during the

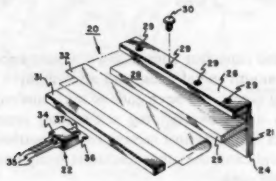
positioning of said coaxial connections on said at least one mounting beam, and being adapted for subsequent rigid connection to said positioning plate prior to rigid connection of each of said positioning plates to said supporting beams.

4,288,839

SOLID STATE DEVICE MOUNTING AND HEAT DISSIPATING ASSEMBLY

Jay M. Prager, Nashua, N.H.; Joseph F. Sadlow, North Reading, and John K. Nitzsche, Concord, both of Mass., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 18, 1979, Ser. No. 85,969
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—386 **12 Claims**



1. A heat dissipating and solid state device mounting assembly adapted for securely holding heat generating solid state devices and for absorbing and dissipating said heat, the assembly comprising

A. a solid state device retaining surface

a. supportingly holding solid state devices removably positioned thereon, and

b. being capable of absorbing heat generated by solid state devices secured thereto;

B. heat dissipating means conductively engaged with the device retaining surface for absorbing heat therefrom and directing the heat for remote dissipation; and

C. solid state device securing means

a. positioned in juxtaposed spaced facing relationship to the solid state device retaining surface, and

b. in movable holding engagement of the solid state devices against said retaining surface,

D. a compression bar positioned between the solid state devices and the device securing means for receiving the holding force of the securing means and applying said force substantially equally to the solid state devices;

E. a thin of an electrical nonconductor, peripherally surrounding and enveloping the solid state devices and the compression bar, thereby assuring no electrical conduction from said solid state devices to either the device retaining surface or the device securing means, while also maintaining the desired electrical spacing;

whereby the solid state devices are securely supportingly maintained in supporting contact with the device retaining surface by being sandwiched between the device securing means and said device retaining surface, thereby completely eliminating any need for fastening means extending through a mounting portion of the solid state device.

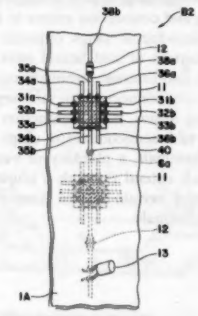
4,288,840

PRINTED CIRCUIT BOARD

Kaoru Konishikawa; Shunsuke Sasaki, both of Hirakata; Kouichi Higuchi, Neyagawa, and Fuminori Hirose, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 21, 1979, Ser. No. 77,760
Claims priority, application Japan, Sep. 26, 1978, 53-118828
Int. Cl.³ H05K *1/18*
U.S. Cl. 361—410 **9 Claims**

1. A printed circuit board for use in electrical and electronic appliances, said board comprising a jumper electronic part including a plurality of confronting through-hole conductive members provided at respective confronting edge portions of a first electrically insulative substrate of rectangular plate-like configuration and conductive layers provided on at least one surface of said electrically insulative substrate for connecting said confronting through-hole conductive members to each other, and a second electrically insulative substrate for said printed circuit board provided thereon with sets for conductive layers crossing on X-Y coordinates in the form of a cross conductive member pattern so as to face corresponding ones of said through-hole conductive members of said jumper elec-



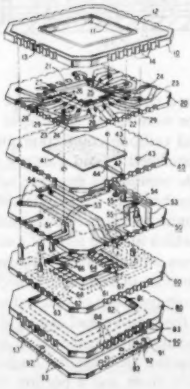
tronic part, with said conductive layers of at least one set of said sets of conductive layers of said second electrically insulative substrate having therein separations to thus form a separated conductive member pattern, said jumper electronic part being mounted to be soldered on said cross conductive member pattern of said second electrically insulative substrate for connecting to each other said set of separated conductor layers of said separated conductive member pattern through crossover wiring by means of said confronting through-hole conductive members and said conductive layers of said first electrically insulative substrate.

4,288,841

DOUBLE CAVITY SEMICONDUCTOR CHIP CARRIER

John F. Gogal, Lebanon, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 20, 1979, Ser. No. 76,972
Int. Cl.³ H05K *7/06;* **H01L** *25/00*
U.S. Cl. 361—414 **2 Claims**



1. A semiconductor device including a double cavity semiconductor chip carrier and a pair of semiconductor chips enclosed in said carrier, an array of internal terminals around

each cavity, and an array of external terminals on a surface of said carrier, each of the semiconductor chips having an array of contacts pads on one major surface,

CHARACTERIZED IN THAT

the chips carrier is made of insulative material and comprises a plurality of layers of ceramic chips fused into a unitary body having a pair of cavities coaxially disposed in opposite faces thereof, metallization patterns are defined on a horizontal surface of each of a plurality of said layers, and said layers provide (1) lateral interconnections at least partially embedded in said unitary body and (2) separate mounting and connection means to the surface of each of said semiconductor chips opposite the said one major surface, certain of said lateral interconnections are connected to said internal terminals, certain lateral interconnections are connected to said separate mounting and connecting means, wire conductors interconnect contact pads on said semiconductor chips and certain of said internal terminals, a plurality of vertical interconnecting means each extend through a plurality of said layers to interconnect certain lateral interconnections to certain external terminals.

4,288,842

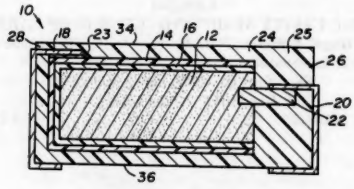
SOLID CHIP CAPACITOR AND METHOD OF MANUFACTURE

Gerald A. Voyles, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Jun. 11, 1979, Ser. No. 47,020

Int. Cl.³ H01L *23/28;* **H01G** *9/00;* **B01J** *17/00*

U.S. Cl. 361—433 **8 Claims**



6. A polarized chip capacitor comprising an anode; a cathode connection member; an electrolyte disposed between said anode and said cathode connection member; a positive lead electrically connected to said anode; a negative lead attached to said cathode connection member; said anode, said cathode connection member, said electrolyte and portions of said leads electrically connected thereto encapsulated within an insulative material which is in the form of a substantially rectangular member in cross section having opposed end and side walls, the exposed portions of said positive and negative leads exiting individually from one each of said end walls of the rectangular member, with the positive lead exiting at a point closer to a side wall of the rectangular member than the negative lead, each lead of said positive and negative leads covers a portion of its end wall it exits from and a portion of the side wall of the rectangular member whereby said leads are wrapped around the rectangular member; and said polarized capacitor rests on and is capable of being electrically connected to a substrate through said leads.

4,288,843

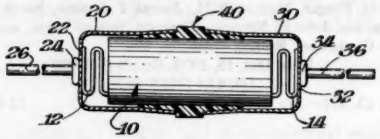
CAPACITOR CONSTRUCTION WITH SELF-LOCKING CLOSURE

Walter W. Schroeder, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 30, 1979, Ser. No. 71,209

Int. Cl.³ H01G *9/00;* **H02G** *13/08;* **H05K** *5/00*

U.S. Cl. 361—433 **10 Claims**



1. A sealed capacitor comprising a wound capacitor section, two open-mouth metal cans, and an insulative bushing with self-locking tapers, the open ends of said cans engaging to said bushing in a non-overlapping self-sealing arrangement, one electrode of said capacitor section being electrically connected to one of said cans, the other electrode being connected to the other of said cans.

4,288,844

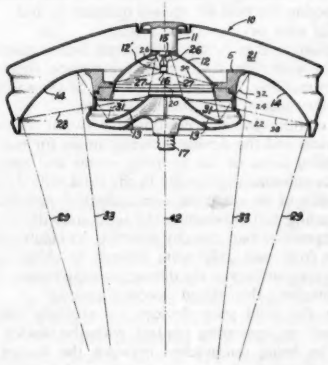
ELECTRICALLY FOCUSED SURGICAL LIGHT

Kenneth J. Fisher, and William R. Miller, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Aug. 24, 1978, Ser. No. 936,240

Int. Cl.³ A61G *13/00*

U.S. Cl. 362—33 **18 Claims**



1. A light comprising a reflector means having an axis of symmetry,

a first light source and a second light source

means supporting said first light source and said second light source on said axis of symmetry and at predetermined distances from said reflector means and in spaced relation to each other one said light source being located closer to said reflector than the other and in spaced relation to said reflector means,

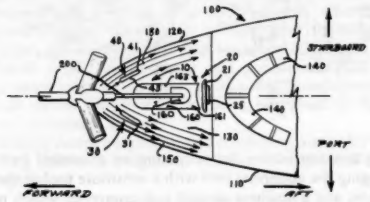
and means connected to said light source and said second light source,

whereby a relatively small light pattern or a relatively large light pattern may be selectively directed onto an object while said reflector and said first light source and said second light source remains stationary.

4,288,845
AERIAL REFUELING RECEPTACLE FLOODLIGHTS-SPOILER AND FUSELAGE, NOSE MOUNTED

Wilma L. Finsness, Bellevue; Richard I. McMonagle, Bothell, and Edward M. Sedenquist, Seattle, all of Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 8, 1979, Ser. No. 64,932
Int. Cl.³ B64D *47/02, 37/00*
U.S. Cl. 362—63 6 Claims



1. An aerial refueling receptacle floodlight illuminating system for use at night in combination with an aricraft having a longitudinal axis, a fuselage with a nose section having an upper surface and airflow lines along said upper surface, a cockpit windshield aft of said upper surface of said nose section and in alignment with said longitudinal axis, and an aerial refueling receptacle located on said upper surface of said nose section and in alignment with said longitudinal axis, with said receptacle having top and front surfaces, comprising:

a. a spoiler floodlight assembly disposed on and in said upper surface of said nose section wherein said assembly includes:

(1) an aerodynamically configurated spoiler retractably mounted substantially vertically upward on said upper surface of said nose section, aft of said refueling receptacle and forward of said cockpit windshield, and disposed transverse to said longitudinal axis;

(2) a first floodlight means for selectively illuminating said refueling receptacle, with said means disposed partially within said spoiler;

(3) and, means for retracting said spoiler into a stowed and longitudinal-like position which is essentially flush with said upper surface of said nose section;

b. a first nose fairing floodlight assembly disposed on and in said upper surface of said nose section, wherein said assembly includes:

(1) a first blade-like configurated fairing mounted substantially vertically upward on said upper surface of said nose section, forward of said cockpit windshield, adjacent to and port of said refueling receptacle, and parallel to such airflow lines along said upper surface of said nose section;

(2) and, a second floodlight means for selectively illuminating said refueling receptacle, with said means disposed partially within said first nose fairing;

c. and, a second nose fairing floodlight assembly disposed on and in said upper surface of said nose section, wherein said assembly includes:

(1) a second blade-like configurated fairing mounted substantially vertically upward on said upper surface of said nose section, forward of said cockpit windshield, adjacent to and starboard of said refueling receptacle, and parallel to said airflow lines along said upper surface of said nose section;

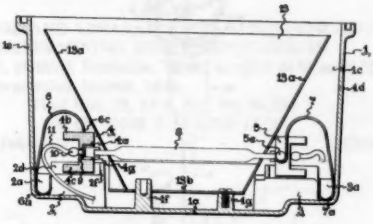
(2) and, a third floodlight means for selectively illuminating said refueling receptacle, with said means disposed partially within said second nose fairing floodlight assembly;

whereby, when said first, second and third floodlight means for selectively illuminating said refueling receptacle are activated, said top and side surfaces of said receptacle are adequately illuminated without glare.

4,288,846
FLOODLIGHT

Thomas A. Fletcher, Dana, and Robert L. Durham, East Flat Rock, both of N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,093
Int. Cl.³ F21S *3/00;* H05B *33/02*
U.S. Cl. 362—217 4 Claims

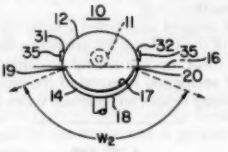


1. A floodlight comprising, in combination, a housing having a rear wall and side walls defining an interior chamber and a front opening opposite said rear wall, said rear wall having a pair of spaced socket guide portions at opposite side walls, said socket guide portions spaced from the side walls adjacent thereto defining recesses therebetween, a pair of elongated spring means each having a mounting end and a socket-holding end and being curved intermediate said ends, said pair of spring means seated at said mounting ends in said recesses for mounting the same in said housing, and a pair of socket members respectively held by said socket-holding ends of said pair of spring means in operative position adjacent said socket guide portions so that said socket members are resiliently movable in a path toward and away from each other, said mounting ends of said pair of spring means being curved and having projections frictionally engaging the housing side walls and socket guide portions defining said recesses.

4,288,847
COMPOUND BEAM ILLUMINATING

William B. Elmer, 2 Chestnut St., Andover, Mass. 01810

Filed Jun. 18, 1979, Ser. No. 49,087
Int. Cl.³ F21V *7/09*
U.S. Cl. 362—297 10 Claims



1. A luminaire comprising,

a light source,

a relatively opaque reflector having a principal light emitting opening, said light source being disposed within said reflector for directing a first primary light beam through said opening in a first principal direction of maximum illumination, and

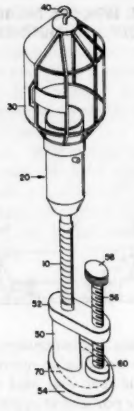
light moderating means in said reflector for directing a second secondary light beam in a direction of lesser illumination substantially orthogonal to said first principal direction and with a predetermined beam expanse extending beyond the boundaries of said first primary light beam.

4,288,848

CLAMP MOUNTED AND PORTABLE EXTENSION LAMP

Stefon Fido, 5 Primrose St., Indian Orchard, Mass. 01151

Filed Dec. 17, 1979, Ser. No. 104,361
Int. Cl.³ F21V *15/00*
U.S. Cl. 362—378 **1 Claim**



1. A lamp comprising in combination:

a flexible neck having an upper outboard extremity and a lower inboard extremity, the neck normally extending in a generally vertical direction, but adapted to be flexed in all directions throughout a 360 degree circle,

a socket housing mounted on the upper outboard extremity of the neck and having a bulb receiving socket,

a bulb threadedly receivable in the socket,

a bulb shield fitted to the socket housing,

a hook on the topmost extremity of the bulb shield whereby the lamp may be suspended from a support such as a pin or post or hook,

means for supplying an electric current to the socket,

a base associated with the lower inboard extremity of the neck in the form of a C clamp including a base bar to which the neck is secured, the neck and base bar extending coaxially as to each other, an upper leg and a lower leg extendable outwardly from and in spaced parallel planes normal to the axis of the base bar, a screw threadedly receivable through the upper leg, a manually engageable knob at the upper end of the screw and a clamp at the lower end of the screw for bringing the C clamp into tight damping relationship with a vertically or horizontally disposed surface, and

a permanent magnet connected fixedly to a surface of the lower leg of the C clamp for providing an effective area of magnetic force on the clamp to support same against tilting and accidental removal of the lamp from a steel or ironcontaining supporting surface when attached thereto.

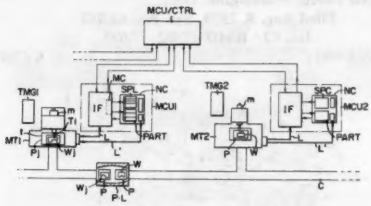
4,288,849

MACHINE TOOL CONTROL SYSTEMS

Tetsu Yoshida, and Katsunori Higashikawa, both of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1979, Ser. No. 9,677
Claims priority, application Japan, Feb. 8, 1978, 53-13167
Int. Cl.³ G05B *19/417*
U.S. Cl. 364—102 **5 Claims**

1. A machine tool control system for controlling a plurality of machine tools, said system comprising machine control units, each comprising a numerical control device and an interface unit interposed between each machine tool and the numerical control device, and respectively provided for the machine tools, said numerical control device including a first memory area which stores a first group of programs related to the machining of a workpiece and also to the selection of cutting tools suitable for the machining, and a second memory area which stores a second group of programs for executing an



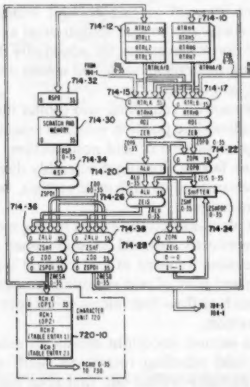
interruption instruction for retracting an abnormal tool and exchanging the abnormal tool with a substitute tool or the like operation, and a machine control unit controller which monitors sequence signals arriving at said interface unit and provides access to said first and second program groups stored in said numerical control device through said interface unit in accordance with a predetermined process program.

4,288,850

APPARATUS FOR IDENTIFICATION AND REMOVAL OF A SIGN SIGNAL CHARACTER SUPERIMPOSED

Jerry L. Kindell, Glendale, and Richard T. Flynn, Peoria, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jan. 2, 1979, Ser. No. 392
Int. Cl.³ G06F *7/00*
U.S. Cl. 364—200 **5 Claims**



1. In a data processing system including a storage unit and a central processing unit, said storage unit randomly storing groups of data signals, a predetermined number of said data signal groups being transferred to said central processing system from said storage unit in response to certain control signals for processing; wherein a preselected one of said transferred data signal groups can be include a data character consisting of a decimal integer and a sign, apparatus for removing said sign from said character in said predetermined data signal group comprising:

data signal group selection means coupled to said storage means for selecting said preselected data signal group from said transferred groups in response to other control signals;

extraction means coupled to said data signal selection means for removing said sign from said character in said preselected group;

alignment means coupled to said storage means for arranging said transferred predetermined number of data signal groups in a pre-established order;

combining means coupled to said alignment means and said extraction means for storing a first and a second comparable sequence of data signal groups, said combining means including means for replacing a data group in a determined position in said first sequence with a data signal group in a comparable determined position in said second sequence in response to a switch signal, wherein said predetermined data signal groups from the alignment means are stored in said first sequence in said pre-established order, and wherein said preselected data signal group with said sign removed is stored in each position of said second sequence before being processed by the central processing system,

switching means coupled to said combining means for generating said switch signal in response to additional control signals.

4,288,851

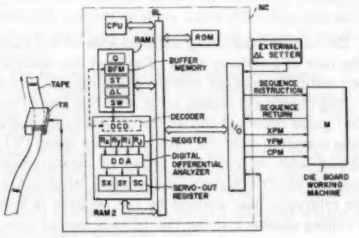
METHOD OF DETERMINING POSITION OF OPENINGS ADAPTED TO RECEIVE FRET SAW BLADE OF NUMERICALLY CONTROLLED FRET SAW MACHINES

Takao Manabe, Shizuoka; Hitoshi Ebata, Mishima, and Shouichi Shin, Shizuoka, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1979, Ser. No. 81,553

Int. Cl.³ G06F *15/46;* G05B *19/18;* B27B *19/00*

U.S. Cl. 364—475 **6 Claims**



1. In a numerically controlled fret saw machine comprising:

blank drive means for clamping a flat plate shaped blank to move the same to any position on a X-Y plane of rectangular coordinates;

fret saw blade rotation means for controlling rotation of said fret saw blade such that a tip of said blade is normally oriented in directions of grooves cut through said blank by said fret saw blade;

a tool disposed on said X-Y plane with a predetermined spacing between the tool and the fret saw blade for forming openings through said blank;

drive means for driving said tool; and

a digital control device for controlling the direction of movements of said blank in X and Y axes directions of rectangular coordinates and for controlling rotation of said fret saw blade, thereby forming with said tool openings adapted to receive said fret saw blade at points respectively corresponding to cutting start points of said grooves,

a method of determining a position of each opening comprising the steps of:

producing a movement instruction data regarding a cutting start point and a cutting end point of a portion of a groove to be cut, said points defining a path A→B;

determining a point P having coordinates (XP·YP) and representing a center of said opening for receiving said fret saw blade, said point P being located on a straight line passing through a point A having coordinates (XA·YA) and a point B having coordinates (XB·YB) and said point P being spaced from said point A by one half of the width SW of said fret saw blade in a direction opposite to the direction of cutting of the groove starting from said point A when said section is straight, whereas when said section is a circular arc, said point P is selected to be a line which is tangent to said ciruclar arc at said point A and spaced from said point A by one half of the width SW of said fret saw blade.

4,288,852

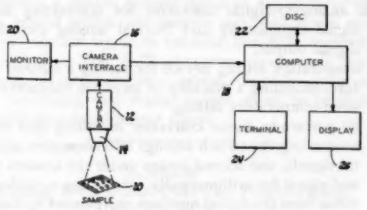
METHOD AND APPARATUS FOR AUTOMATICALLY DETERMINING SHEET METAL STRAIN

Steven W. Holland, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1979, Ser. No. 98,260

Int. Cl.³ G06K *9/36;* G06F *15/20*

U.S. Cl. 364—508 **5 Claims**



4. Apparatus for automatically determining the strain induced in a sheet metal sample by a forming operation, said sample having a grid of circles of predetermining diameter printed thereon prior to said operation, which circles are stretched into patterns of generally elliptical shape as a result of said operation, said apparatus comprising:

means for obtaining a digital representation of the average light intensity of discrete elements of the image of a portion of the sample including at least one of said patterns;

digital computer means for storing said digital representation in addressable memory locations, said computer being programmed to:

(a) determine a threshold level of light intensity which is a gradient-weighted average light intensity in transition areas of the image where the gradient of light intensity exceeds a predetermined value;

(b) segment the image into binary regions, one region type comprising contiguous image elements whose light intensity levels are less than said threshold and the other region type comprising contiguous image elements whose light intensity levels are equal to or greater than said threshold;

(c) identify a plurality of points residing on the boundary of one region type which is totally within the field of view defined by the image and is greater than a predetermined size;

(d) fit an ellipse to said points;

(e) identify those points within a predetermined tolerance distance from the fitted ellipse and refit an ellipse to the points so identified, reduce said tolerance distance and repeat this step (e) a predetermined number of times or until a predetermined root-mean-square percent error is attained;

(f) calculate at least one of the diameters of the fitted ellipse and;

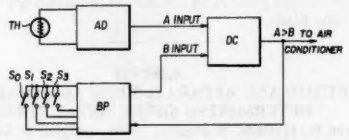
(g) calculate the strain induced in the sample as a function of the calculated diameter and the predetermined diameter of said circles.

4,288,853

DIGITAL TEMPERATURE CONTROL SYSTEM

Michika Uesugi, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 26, 1979, Ser. No. 61,044
Claims priority, application Japan, Jul. 28, 1978, 53-92166
Int. Cl.³ G05D *23/00*
U.S. Cl. 364—557 **5 Claims**



1. A digital temperature control system for controlling the temperature of a space, comprising:

a thermal sensing element for detecting the temperature of the space and for supplying an analog signal proportional thereto,

an analog-to-digital converter for converting an analog signal supplied by said thermal sensing element into a digital output,

a temperature setting device for setting a desired temperature, including a plurality of switches indicative of a desired temperature setting,

a bit pattern-to-digital converter including first means for converting the switch settings into respective sets of digital signals, and second means under the control of a control signal for arithmetically subtracting a predetermined value from the digital numbers represented by said respective sets of digital signals, said bit pattern-to-digital converter generating an output indicative of either said respective set of digital signals or said respective set of digital signals in which said predetermined value is arithmetically subtracted in dependence on the state of said control signal, and

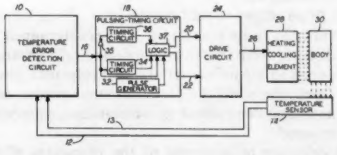
a digital comparator for comparing the digital output from said analog-to-digital converter with the output from said bit pattern-to-digital converter and for generating and transmitting said control signal only in case the digital output from said analog-to-digital converter is greater than the digital output from said bit pattern-to-digital converter, said control signal adapted for use in connection with a means for changing the temperature of said space to cause said temperature changing means to change the temperature of said space in dependence on the state of said control signal.

4,288,854

BI-MODAL TEMPERATURE CONTROLLER

Mark S. Burroughs, Jonestown, Pa., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Sep. 12, 1979, Ser. No. 75,290
Int. Cl.³ G05D *23/19;* **F25B** *29/00*
U.S. Cl. 364—557 **10 Claims**



9. A method for controlling the temperature of a body comprising the steps of:

(a) generating a digital status signal which indicates whether the temperature of the body is greater than or less than a desired temperature;

(b) timing an interval following each change of said digital status signal;

(c) generating a first pulse train and a second pulse train, said first pulse train having a duty cycle which is less than the duty cycle of said second pulse train;

(d) passing said first pulse train to a signal node prior to expiration of the time interval;

(e) passing said second pulse train to said signal node after expiration of the time interval; and

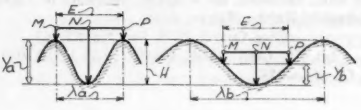
(f) heating or cooling the body in response to said digital status signal and at a rate related to the duty cycle of the signal appearing at said signal node.

4,288,855

DEVICE FOR MEASURING DEFORMATIONS OF THE TRAVEL SURFACE OF THE RAILS OF A RAILWAY

Romolo Panetti, Geneva, Switzerland, assignor to Speno International, S.A., Geneva, Switzerland

Filed Mar. 5, 1980, Ser. No. 127,394
Claims priority, application Switzerland, Mar. 6, 1979, 2164/79
Int. Cl.³ G01B *7/28;* **E01B** *27/00*
U.S. Cl. 364—561 **7 Claims**

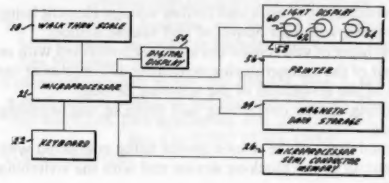


1. Device for measuring deformations of the travel surface of the rails of a railway track of at least one wavelength contained within a selected wavelength range (λ_1), comprising a traveling chassis (**1**) resting on at least one line of rails by two spaced guide rollers (**3** and **4**), the chassis being connected to a vehicle traveling over the track at a given speed (V) and being equipped with at least one group of measurement pickups giving off electric signals representing distances between a linear reference base defined by the position in space, of the said rolling chassis and the line of rails moved over, and also comprising a circuit for the processing of these signals intended to determine the value of the trough (H_1) of the said wavelength deformation, characterized by the fact that the group of measurement pickups comprises at least one first set of two pickups (**5** and **6**) arranged opposite a generatrix of the line of rails moved over at a distance from each other (E_1) less than the shortest wavelength ($\lambda_1 M$) of the selected wavelenth range (λ_1) and supplying two electric signals representing two distances respectively (h_A and h_C) between two points (A and C) of the base reference line (AC) of the base reference line (AC) and the said generatrix, and by the fact that these two pickups are connected to an electronic measurement circuit comprising a comparator (**8**) giving off an output signal representative of the difference ($\Delta_1 = h_A - h_C$) of the two said distances, an apparatus (**9**) for determining the effective average length ($\lambda_1 E$) of the wave of the deformation detected, giving off an output signal representing said magnitude, and an apparatus (**10**) for the processing of these signals (Δ_1 and $\lambda_1 E$) connected to the outputs of the comparator (**8**) and of the determination apparatus (**9**) and delivering an electric output signal representative of the trough (H_1) of the said deformation by processing of the said difference (Δ_1) in accordance with a transfer coefficient (T_1) established on basis of the ratio ($E_1/\lambda_1 E$) between the distance (E_1) between the two pickups (**5** and **6**) and the determined effective average length ($\lambda_1 E$) of the wave of the detected deformation.

4,288,856
LIVESTOCK FEEDLOT MANAGEMENT METHOD AND APPARATUS

Gerald S. Linseth, 13015 Caminito Del Rocio, Del Mar, Calif. 92014

Filed Dec. 14, 1979, Ser. No. 103,533
Int. Cl.[3] A01K 5/00; G01G 19/04
U.S. Cl. 364—567 5 Claims



1. A method of culling animals having poor weight gain characteristics from a feed lot herd which comprises:

providing each animal with an identifying number;

entering the identifying number into a memory system;

directing each animal individually through a walk-through scale;

displaying a first weight for observation the weight of each animal as indicated by said scale;

indicating which of a plurality of selected weight ranges the indicated first weight of each animall falls within;

entering the indicated first weight of each animal in said memory system;

actuating a detector as the animal leaves the scale to automatically open the scale entrance for the next animal;

directing animals from said scale to at least one feeding pen;

after a selected number of days, again directing said animal through the weighing system to obtain a second weight of each animal;

entering the second weight in said memory system;

comparing the first and second weights for each animal and the time period between weighings to determine the average daily weight gain for each animal;

determining relative to a selected standard which animals have accomplished a satisfactory weight gain; and

actuating appropriate ones of a plurality of gates at the outlet of said scale to direct animals having different weight gain characteristics to different pens;

whereby animals having unsatisfactory weight gain characteristics are separated from the balance of the herd.

4,288,857
DIGITAL INTEGRATING/AUTO-CORRELATOR APPARATUS

Jack E. Wilterding, Aurora, and John J. Cozzens, Lakewood, both of Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 21, 1980, Ser. No. 123,334
Int. Cl.[3] G06F 15/336; G01S 9/42
U.S. Cl. 364—728 8 Claims

1. A digital integrating/auto-correlator apparatus comprising in combination:

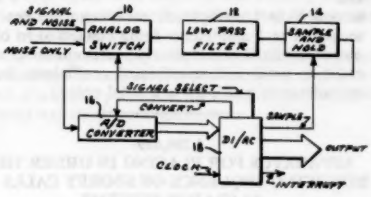
switching means for receiving a first and second signal,

a filter means for receiving the output from said switching means, said filter means providing a filtered output signal,

a sample and hold means connected to said filter means to receive said filtered output signal, said sample and hold means receiving a sample control signal, said sample and hold means providing a time invariant output signal,

an A/D converter means connected to said sample and hold means to receive said output signal therefrom, said A/D converter means receiving a convert control signal, said A/D converter means providing a digital output signal, and,

a digital integrating/auto-correlator means receiving said digital output signal from said A/D converter means, said digital integrating/auto-correlator means receiving an externally generated clock signal for synchronizing signal processing within itself, said digital integrating/auto correlator means generating a signal select control signal which is applied to said switching means to switch either

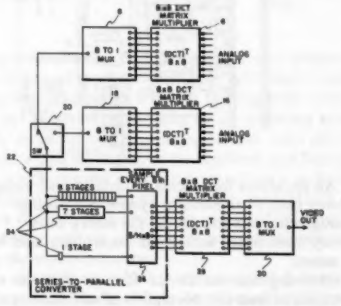


of said first or second signal to the output of said switching means, said digital integrating/auto-correlator means also generating a sample control signal to establish the sampling period within said sample and hold means and a convert control signal to establish the A/D conversion period within said A/D converter means, said digital integrating/auto-correlator means digitally integrating and correlating said digital output signal to provide a digitally correlated output signal.

4,288,858
INVERSE TWO-DIMENSIONAL TRANSFORM PROCESSOR

Pasquale A. Merola, Brookfield, Wis., and Marshall K. Quick, Whitesboro, N.Y., assignors to General Electric Company, Utica, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,643
Int. Cl.[3] G06G 7/22; G06F 15/34
U.S. Cl. 364—826 4 Claims



1. An inverse two-dimensional transform processor sampling N samples of source data within an N×N sub-block of data received at a source decoder comprising:

a plurality of matrix multiplier means accepting said source data, each of said matrix multiplier means calculating N one-dimensional transformed data samples, each of said matrix multiplier means having N input terminals and N output terminals;

a plurality of N to 1 multiplexers, each having N input terminals and 1 output terminal, each of said multiplexers being connected to one of said matrix multiplier means so that each output terminal of one of said matrix multiplier means is connected to one of said N input terminals of one of said multiplexers;

a switching means accepting sequential samples from each of said N to 1 multiplexers and ordering them so that they are in a serial order;

a series to parallel data converter means accepting said serial samples in a serial order from said switching means and transforming the order of said samples into a parallel order;

a second matrix multiplier means accepting N samples in a parallel order from said series to parallel data converter and yielding N one-dimensional transformed coefficients; and

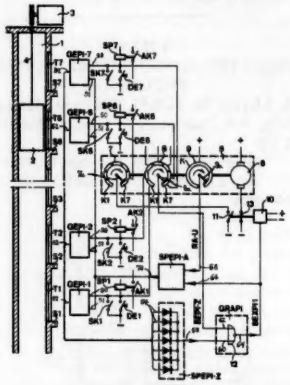
a second N to 1 multiplexer, each input terminal of said second N to 1 multiplexer being connected to one of N output terminals of said second matrix multiplier means in order to yield said transformed coefficients from said second matrix multiplier in a serial order.

4,288,859

APPARATUS FOR PLACING IN ORDER THE SERVICING SEQUENCE OF STOREY CALLS OF ELEVATOR SYSTEMS

Stephan Zeindler, Gunzwil, and Hans G. Siiss, Udligenswil, both of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland

Filed Nov. 2, 1978, Ser. No. 957,335
Claims priority, application Switzerland, Nov. 8, 1977, 13964/77
Int. Cl.[3] B66B *1/18*
U.S. Cl. 364—900 3 Claims



1. An apparatus for placing in order the servicing sequence of storey calls of an elevator system comprising:

storage elements for storing the storey calls;

storey transmitter means for controlling said storage elements;

a revolving scanner device for scanning the storage elements, at least one revolution of said scanner corresponding to a servicing period;

a drive for driving said scanner device;

a respective further storage element operatively associated with each storey being serviced;

each said further storage element having a first input, a second input and an output;

said first input being connected with the related storage element serving for storing a storey call;

an OR-circuit having an output composed exclusively of diodes;

a blocking device for blocking the infed and stored storey calls during at least one servicing period corresponding to a revolution of the scanner device;

said output of each further storage element being connected by means of said OR-circuit with said blocking device;

said blocking device comprising a NOR-circuit having two inputs, one of said inputs being connected to the output of said OR-circuit, the other of said inputs being connected by means of said scanner device to the first input of said further storage element, and an output;

a release device freeing the blocked storage calls after completion of a servicing period for storey servicing during the following servicing period;

said release device having a first input, a second input and an output;

said second input of each said further storage element being connected with said output of said release device;

said first input of said release device being connected with an output of the scanner device delivering information at the start of the revolution of the scanning device;

a switching device controlling said drive of said scanning device;

the second input of the release device being connected with the output of the blocking device and with the switching device;

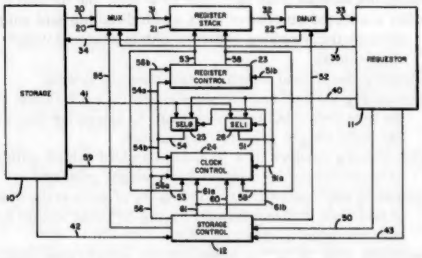
the release of the stored storey calls and thus the initiation of a new servicing period only then being accomplished if there appears at the output of the blocking device information signaling the completion of the storey calls freed in the preceding servicing period.

4,288,860

DYNAMIC STORAGE SYNCHRONIZER USING VARIABLE OSCILLATOR AND FIFO BUFFER

John R. Trost, Anoka, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 2, 1979, Ser. No. 63,312
Int. Cl.[3] G06F *5/06*
U.S. Cl. 364—900 5 Claims



1. In a data processing system having a dynamic storage subsystem capable of being written into wherein said dynamic storage subsystem writes data in response to a first control clock and having a requestor capable of accessing said dynamic storage subsystem to write into said dynamic storage subsystem wherein said requester tranfers data to be written into said dynamic storage subsystem in response to a second control clock, the improved method of controlling the rate of transferring data to be written into said dynamic storage subsystem from said requestor to said dynamic storage subsystem comprising:

(a) transferring data to be written into said dynamic storage subsystem from said requestor to a first-in-first-out buffer memory in response to said second control clock;

(b) transferring data to be written into said dynamic storage subsystem from said first-in-first-out buffer memory to said dynamic storage subsystem in response to said first control clock;

(c) sensing constantly a change in the amount of data to be written into said dynamic storage subsystem which is stored within said first-in-first-out buffer memory;

(d) increasing the rate of said first control clock when said change in the amount of data to be written into said dy-

namic storage subsystem which is stored within said first-in-first-out buffer memory increases; and

(e) decreasing the rate of said first control clock when said change in the amount of data to be written into said dynamic storage subsystem which is stored within said first-in-first-out buffer memory decreases.

4,288,861

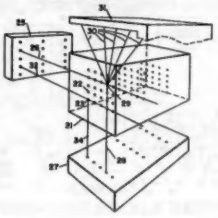
THREE-DIMENSIONAL SYSTEMS

Wyn K. Swainson, Berkeley, and Stephen D. Kramer, Oakland, both of Calif., assignors to Formigraphic Engine Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 856,434, Dec. 1, 1977, which is a continuation-in-part of Ser. No. 544,480, Jan. 27, 1975, Pat. No. 4,078,229. This application Jan. 22, 1979, Ser. No. 5,259

Int. Cl.³ G11C *11/42, 13/04*

U.S. Cl. 365—127 **11 Claims**



1. An optical element having inhomogeneity of refractive index which is constructed by directing into a photoreactant substantially dispersed in a fluid medium a first optical beam at a first wavelength which is matched to a characteristic spectral absorption region of said photoreactant, and directing a second optical beam of a second wavelength matched to a characteristic spectral absorption region of said photoreactant such that the first optical beam and the second optical beam intersect to generate a mono-molecular reaction in the region of beam intersection to generate a substantially persistent change in refractive inex in said region, said first and second optical beams being translatable to produce within said medium a controlled refractive index distribution useful for performing an optical function determined by a pattern of said distribution.

4,288,862

MEMORY CIRCUIT

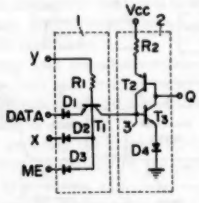
Ichiro Ohhinata; Seiei Ohkoshi, and Hideo Suzuki, all of Yokohama, Japan, assignors to Nippon Telegraph and Telephone Public Corp. and Hitachi, Ltd., both of Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 971,109

Claims priority, application Japan, Dec. 21, 1977, 52-152896; Dec. 28, 1977, 52-157864

Int. Cl.³ G11C *11/40, 15/04*

U.S. Cl. 365—181 **11 Claims**



1. A memory circuit comprising

a memory cell including two complementary transistors operatively connected to form a four-layer semiconductor having an input for receiving a data signal to be stored therein,

a control input circuit including transistor means having at least one input transistor with its collector connected to the input of said memory cell,

first input means connected to said control input circuit including first, econd and third input terminals receiving respective logical signals,

second input means including a fourth input terminal receiving a data signal to be stored in said memory cell, means for connecting said fourth input terminal to an emitter of said input transistor and

said control input circuit further including control means for controlling the base current of said input transistor on the basis of a logical product of the signals applied to said first, second and third input terminals.

4,288,863

PROGRAMMABLE SEMICOND[illegible]TOR MEMORY CELL

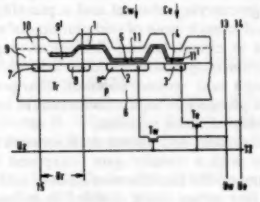
Fritz G. Adam, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 21, 1980, Ser. No. 132,587

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1979, 2916884

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—182 **12 Claims**



1. A programmable non-volatile semiconductor memory cell consisting of an n-channel insulated gate field effect transistor comprising a gate electrode which is floating with respect to potential, and enclosed on all sides by an insulating material and which, in its surface expansion, extends with electrode parts beyond a channel region of the insulated gate field effect transistor, which channel region is arranged on a surface of a monocrystalline semiconductor substrate, and which gate electrode is coupled capacitively by means of two electrode parts of different size via an insulated gate, to respective programming electrodes wherein:

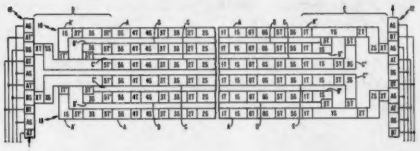
an erase electrode to which an erase signal is capable of being applied, is created by a first planar zone forming a pn-junction with the semiconductor substrate, and which, together with a first electrode part of the gate electrode forms a first capacitance which is substantially smaller than a second capacitance between a second electrode part and a write electrode to which a write signal is capable of being applied, and wherein

between said first planar zone and a first surface portion of said gate electrode there is arranged an insulating layer which is genetically grown on the free surface of said first planar zone and has a thickness ranging between 100 and 300 angstrom units and which forms a tunnel junction at a sufficiently high existing field strength, between said first planar zone and said first surface portion of the gate electrode so that the recharging of said gate electrode is effected by tunnel currents.

4,288,864
SERIAL-PARALLEL-SERIAL CCD MEMORY SYSTEM WITH FAN OUT AND FAN IN CIRCUITS

Thomas V. Harroun, Essex Junction; Lawrence G. Heller, South Burlington, and Norbert G. Vogl, Jr., Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 24, 1979, Ser. No. 87,843
Int. Cl.³ G11C *11/40, 19/28*
U.S. Cl. 365—219 **9 Claims**



1. A serial-parallel-serial charge coupled device memory system comprising

serial input and output sections each having a charge-carrying channel,

first and second common charge-carrying channels, and

first and second adjacent subsets of a main storage section, each of said subsets including a plurality of series registers having charge-carrying channels arranged parallel to each other, each register of said plurality of series registers having an input and an output, a fan out circuit having charge-carrying channels and a common input connected to said serial input section through said first common charge-carrying channel and a plurality of outputs connected to each input of said plurality of series registers and a fan in circuit having charge-carrying channels and a common output connected to said serial output section through said second common charge-carrying channel and a plurality of inputs connected to each output of said plurality of series registers,

said serial input and output sections each including storage nodes with a transfer gate interposed between adjacent storage nodes, the common input of said fan out circuit of said first subset being coupled to a first storage node of said serial input section and the common input of said fan out circuit of said second subset being coupled to a second storage node of said serial input section, the common output of said fan in circuit of said first subset being coupled to a first storage node of said serial output section and the common output of said fan in circuit being coupled to a second storage node of said serial output section, said first storage nodes of said serial input and output sections being interconnected by said first subset and said second storage nodes of said serial input and output sections being interconnected by said second subset and a third storage node interposed between said first and second storage nodes in each of said serial input and output sections.

4,288,865
LOW-POWER BATTERY BACKUP CIRCUIT FOR SEMICONDUCTOR MEMORY

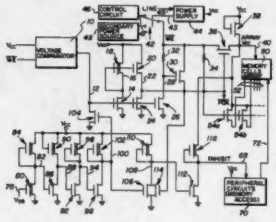
Andrew C. Graham, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Feb. 6, 1980, Ser. No. 119,293
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—229 **12 Claims**

1. A circuit for maintaining a bit pattern which is stored in a memory array of an integrated semiconductor memory circuit during a low power mode, said memory circuit including peripheral memory access circuits for reading and writing data into and from said memory array, a primary power terminal, and a control terminal which receives secondary power upon failure of a primary power source connected to power said memory circuit through said primary power terminal, said memory array having a dedicated power node, comprising in combination:

means for comparing the voltages received by said memory circuit at said primary power terminal and at said control terminal to produce a first state at an output node of said means for comparing when the voltage at said control terminal does not exceed the voltage at said primary power terminal by more than a preselected offset voltage and to produce a second state at said output node when the voltage at said control terminal exceeds the voltage at said primary power terminal by more than said preselected offset voltage,

means for coupling said primary power terminal to said memory array power node through a low impedance path when said voltage comparator output node is at said first state and through a high impedance path when said voltage comparator output node is at said second state,



means for coupling said control terminal to said memory array power node through a high impedance path when said voltage comparator output node is at said first state and through a low impedance path when said voltage comparator output node is at said second state,

means for generating a substrate bias voltage for said integrated memory circuit,

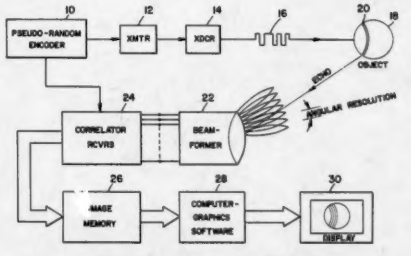
means for monitoring said substrate bias voltage to produce a first state at a monitor node when said substrate bias voltage is greater than a preset magnitude and to produce a second state when said substrate bias voltage is less than said preset magnitude, and

means for inhibiting said peripheral circuits when said output node of said voltage comparator is at said second state or said monitor node is at said second state to prevent said peripheral circuits from accessing said memory array.

4,288,866
ULTRASONIC IMAGE SYSTEM

George L. Sackman, Carmel Valley, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 9, 1979, Ser. No. 83,044
Int. Cl.³ G01S *7/20*
U.S. Cl. 367—11 **12 Claims**



1. An ultrasonic image system comprising:

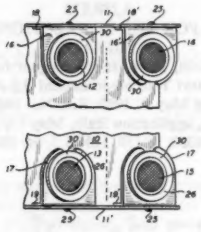
(a) a transmitter for transmitting a large time-bandwidth product signal waveform;
(b) means for pulse modulating said transmitter to produce a coded output pulse;
(c) means for converting said coded output pulse into ultrasonic energy;
(d) a beamformer having a plurality of fine angular resolution cells for receiving the echoes of said coded output pulse reflected from an object to be imaged;
(e) means for correlating said received echoes with a replica of said coded output pulse from said pulse modulating means such that each of said resolution cells receiving said echoes responds only to the correlation between said echoes and said stored replica;
(f) means for storing the output of said correlating means for each of said range cells in the form of a three-dimensional data base of object reflectivity; and
(g) means for displaying said three-dimensional data base in a graphic form which readily assists in object identification.

4,288,867

AREA INTRUSION ADJUSTABLE DETECTOR UNIT

Leo A. Guthart, Old Westbury, N.Y., assignor to Alarm Device Manufacturing Company, Syosset, N.Y.

Filed Nov. 14, 1978, Ser. No. 960,727
Int. Cl.³ G08B *13/16*
U.S. Cl. 367—93 **11 Claims**



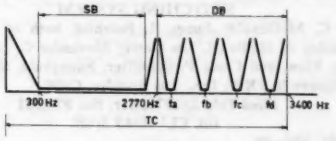
1. A detector unit for detection of intrusion in an interior area between said detector unit and a wall spaced from said unit, comprising:
(a) a chassis frame,
(b) a transducer-transmitter,
(c) a transducer-receiver,
(d) bracket means mounting said transducer-transmitter and said transducer-receiver on said chassis frame,
(e) swiveling means engageable with said bracket means and with said chassis frame, rotatably so mounting said bracket means on said frame,
(f) means energizing said transducer-transmitter to beam ultrasonic waves into said area to be so monitored for intrusion, with the echoes of said waves so beamed returning to said transducer-receiver,
(g) said means so securing the transducer-transmitter and transducer-receiver, to thereby fix the paths of transmission and return echo waves, and
(h) means comparing the energy value of the echo waves so returned with that of the waves so beamed, for generating an alarm circuit responsive to the difference in value between the waves so beamed and the echo waves so returned.

4,288,868

SATELLITE COMMUNICATION SYSTEM FOR SPEECH AND TELEGRAPHY

Hermanus H. Grotjohann, and John R. Reynders, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,612
Claims priority, application Netherlands, Jun. 20, 1978, 7806618
Int. Cl.³ H04L *5/18*
U.S. Cl. 370—30 **4 Claims**



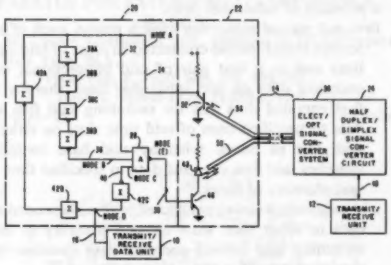
1. A communication system for the transmission on a telephony channel of speech signals located within a speech band as well as at least one data channel comprising data signals modulated on a sub-carrier in a data band which is located outside the speech band, the system comprising at least three stations each station comprising a transmitter and a receiver each operating on one of two mutually different frequencies—which belong to one frequency pair—for half-duplex data communication combined with full-duplex speech communication, characterized in that each station comprises a second receiver having a receive frequency which corresponds to the frequency of the transmitter of that station.

4,288,869

HALF-DUPLEX/SIMPLEX DIGITAL SIGNAL CONVERTER

James S. Kolodzey, Chippewa Falls, Wis.; Francis E. Noel, Jr., Knightdale, and George R. Stilwell, Jr., Raleigh, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 23, 1980, Ser. No. 114,525
Int. Cl.³ H04L *5/16*
U.S. Cl. 370—31 **4 Claims**



1. A half-duplex/simplex digital signal converter circuit comprising:
a multiple input coincidence gate having a first input connected directly to a receiving simplex line and its output connected to a transmitting simplex line;
a first time delay circuit connecting a second input of said gate to said receiving simplex line for causing a received simplex signal to be applied to said gate after a first delay period;
a second time delay circuit connecting a third input of said gate to said receiving simplex line for causing an inverted form of a received simplex signal to be applied to said gate after a second delay period shorter than said first delay

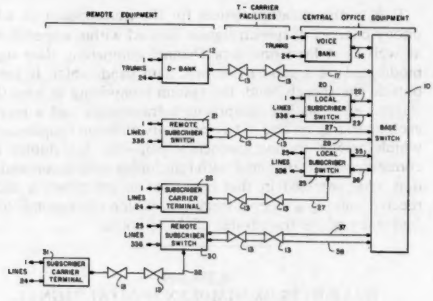
period, said second time delay circuit being connected to the half-duplex line.

4,288,870

INTEGRATED TELEPHONE TRANSMISSION AND SWITCHING SYSTEM

John C. McDonald; James R. Baichtal, both of Los Altos; Bradley A. Helliwell, Los Gatos; Alexander C. Ling, Mountain View, and Craig P. Schaffter, Sunnyvale, all of Calif., assignors to TRW, Inc., Los Angeles, Calif.

Filed Feb. 2, 1978, Ser. No. 874,521
Int. Cl.³ H04J *3/00*
U.S. Cl. 370—56 **31 Claims**



1. An integrated telephone transmission system operating in a multiframe format where each frame consists of a plurality of time slots having a time slot rate, said system comprising:

a plurality of multitime-slot bidirectional data buses,

base switch means connected to said data buses for specifying selected ones of said time slots and for switching data between the specified time slots,

a plurality of subscriber lines,

first and second subscriber switch means, each of said subscriber switch means connected to some of said subscriber lines and to a first pair of said bidirectional buses for encoding data on said subscriber lines, thereby forming first encoded data and for switching said first encoded data to specified ones of said time slots on either bus of said pair of buses, whereby said base switch means switches said first encoded data to specified time slots on said plurality of buses,

said base switch means connected to receive second encoded data in other time slots on said plurality of buses for switching said second encoded data to other specified time slots on either of said pair of buses,

said first and second subscriber switch means connected to receive said second encoded data for decoding said second encoded data and for switching the resulting decoded data to specified ones of said subscriber lines,

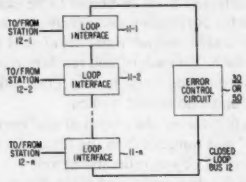
said first subscriber switch means including means for encoding data on said subscriber lines thereby forming third encoded data, interchanger means having a plurality of channel unit locations corresponding to said subscriber lines, and means for switching said third encoded data between specified ones of said locations in said interchanger means, means for decoding said switched encoded data, and means for switching the decoded data resulting from the latter operation to specified ones of said subscriber lines.

4,288,871

DIGITAL LOOP CONFERENCING SIGNAL CORRECTION ARRANGEMENT

Charles R. Baugh, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 5, 1979, Ser. No. 91,406
Int. Cl.³ H04J *3/08*; H04M *3/56*
U.S. Cl. 370—86 **7 Claims**



1. An error correction circuit for use in a continuous loop communication system where a plurality of communication stations have access thereto via interface circuits associated with each station,

said error correction circuit comprising

means for sampling the combined loop signal at a particular location within said loop,

signal reduction means,

means for modifying each said sampled signal by said signal reduction means so as to provide a new combined signal, said combined signal having a smaller absolute mathematical value than said sampled signal, and

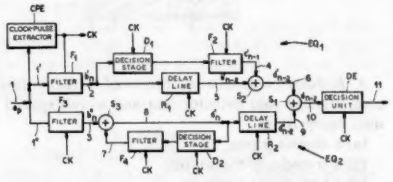
means for substituting on said loop said combined signal for said sampled signal.

4,288,872

EQUALIZER FOR THE CORRECTION OF DIGITAL SIGNALS

Giovanni Tamburelli, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed May 9, 1980, Ser. No. 148,237
Claims priority, application Italy, May 11, 1979, 67999 A/79
Int. Cl.³ H03K *5/159*; H04B *3/04*; H04L *25/03*
U.S. Cl. 375—14 **7 Claims**



1. An equalizer for eliminating the effects of postcursor and precursor interference from a periodically sampled train of incoming digital signals, comprising:

receiving means connected to a transmission path carrying said incoming signals;

a first circuit branch connected to said receiving means, said first branch including first filter means for converting a given signal sample into a first linearly prefiltered signal with at least partial suppression of postcursor effects, first threshold means connected to said first filter means for deriving a first quantized pulse from said first prefiltered signal, second filter means connected to said first threshold means for generating a precursor-compensating signal from said first quantized pulse, first delay means connected to said first filter means for emitting a retarded signal corresponding to said first prefiltered signal, and first adding means connected to said first delay means and

to said second filter means for algebraically combining said retarded signal with said precursor-compensating signal to produce a first purged signal;

a second circuit branch connected in parallel with said first circuit branch to said receiving means, said second branch including third filter means for converting said given signal sample into a second linearly prefiltered signal with at least partial suppression of precursor effects, second threshold means in a feedback loop with an input end downstream of said third filter means for deriving a second quantized pulse from said second prefiltered signal, fourth filter means in said feedback loop connected to said second threshold means for generating a postcursor-compensating signal from said second quantized pulse, second adding means upstream of said input end connected to said third and fourth filter means for algebraically combining said second prefiltered signal with said postcursor-compensating signal to produce a corrected feedback signal, and second delay means connected to said second adding means downstream of said input end for emitting a second purged signal temporally correlated with said first purged signal;

summing means connected to said first and second branches for algebraically combining said first and second purged signals into a resulting signal; and

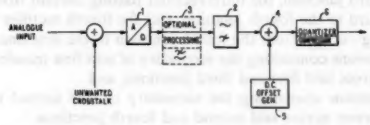
decision means connected to said summing means for converting said resulting signal into a quantized output pulse.

4,288,873

ANALOGUE TO DIGITAL CONVERTERS

Michael J. Gingell, Raleigh, N.C., assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 23, 1979, Ser. No. 96,728
Int. Cl.³ H03K *13/01;* **H04B** *12/02*
U.S. Cl. 375—25 **3 Claims**



1. A pulse code modulated encoding arrangement comprising a linear analogue-to-digital converter having an input analogue signal coupled thereto and producing pulse code groups each containing a first number of bits, a digital high pass filter to which the analogue-to-digital converter output is applied to remove unwanted dc offset and low frequency components present in said input analogue signal and generated in said analogue-to-digital converter, and means for adding to the high pass filter output a predetermined amount of dc offset for minimizing idle noise and reducing crosstalk enhancement.

4,288,874

TIMING DATA REPRODUCTION SYSTEM

Kunihiro Yamada, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

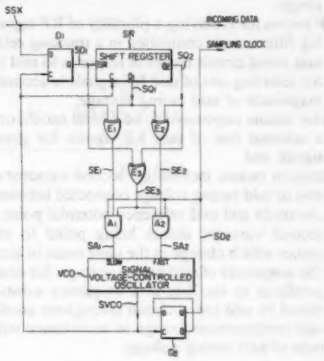
Filed May 9, 1979, Ser. No. 37,486
Claims priority, application Japan, May 15, 1978, 53/56673
Int. Cl.³ H04L *7/00*
U.S. Cl. 375—118 **8 Claims**

1. A system for providing a sampling clock reference signal for information encoded in a digital data signal having a given pulse repetition rate and pulse width, comprising:

means including a variable frequency or phase oscillator for sampling said digital data signal at successive time intervals determined by the frequency of the oscillator output signal, said frequency being on the order of twice said given pulse repetition rate, so that said sampling time intervals are on the order of one-half said digital data signal pulse width;

a shift register coupled to said sampling means for storing successive groups of samples of said digital data signal, each group comprising at least two successive samples thereof;

oscillator control means including a logic circuit for converting the pattern of digital data signal samples stored in said shift register into a control signal, the value of which



is indicative of whether the phase of said digital data signal leads or lags the phase of said oscillator,

said oscillator control means further including means for varying the frequency or phase of the output signal of said oscillator in accordance with said control signal so that the phase of said oscillator is maintained in coincidence with the phase of said digital data signals; and

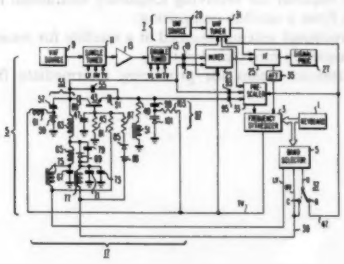
frequency divider means for synchronously dividing the frequency of the oscillator output signal in half to provide said sampling clock reference signal.

4,288,875

CONTROLLED LOCAL OSCILLATOR WITH APPARATUS FOR EXTENDING ITS FREQUENCY RANGE

George W. Carter, Greenfield, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 8, 1980, Ser. No. 119,991
Int. Cl.³ H04B *1/26;* **H03B** *5/12*
U.S. Cl. 455—197 **4 Claims**



1. In a tuner for tuning channels in a predetermined range of frequencies, apparatus comprising:

channel selection apparatus for generating a tuning voltage having magnitudes corresponding to selected channels;

a local oscillator for generating a local oscillator signal including a transistor having base, collector and emitter

electrodes configured as a common base amplifier, said base electrode being connected to a reference potential point; a first varactor diode responsive to said tuning voltage and at least one inductor configuration connected in a parallel combination between said collector electrode and said reference potential point; and feedback means, including a capacitor connected between said collector and emitter electrodes, for conditioning said oscillator to oscillate at a frequency substantially determined by said tuned circuit in at least a portion of said predetermined range;

RF means for receiving a plurality of RF signals and including filter means controlled in a tracking relationship with said tuned circuit means in response to said tuning voltage for selecting one of said RF signals in accordance with the magnitude of said tuning voltage;

mixer means responsive to said local oscillator signal and to a selected one of said RF signals for generating an IF signal; and

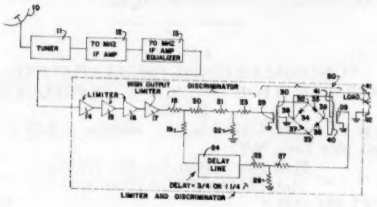
extension means, including a second varactor diode responsive to said tuning voltage connected between said emitter electrode and said reference potential point, said first and second varactor diodes being poled to exhibit capacitances which change in the same sense in accordance with the magnitude of said tuning voltage, for conditioning said oscillator to oscillate at a frequency substantially determined by said tuned circuit throughout another portion of said predetermined range in accordance with the magnitude of said tuning voltage.

4,288,876

DEMODULATOR FOR FREQUENCY MODULATED SIGNALS

William M. Lennox, Rockville, and Hank S. Lin, Silver Spring, both of Md., assignors to Microdyne Corporation

Filed Mar. 28, 1977, Ser. No. 782,202
Int. Cl.³ H04B *1/26*
U.S. Cl. 455—214 **7 Claims**



1. A receiver for receiving frequency modulated television signals from a satellite comprising:

a directional antenna beamed at a satellite for receiving the frequency modulated waves,

heterodyne means for producing intermediate frequency signals that are frequency modulated in accordance with the frequency modulations on the television signals received from the satellite, said heterodyne means having an output,

limiter means in the output of the heterodyne means for limiting the amplitude of the signals in said output of said heterodyne means, said limiter means having an output,

power splitter means having an input connected to the output of the limiter means for splitting the output of said limiter means into first and second outputs,

a double balanced mixer having first and second inputs,

first isolation and attenuator means connecting the first output of said power splitter to the first input of said double balanced mixer,

a delay line having an input fed by the second output of said power splitter, said delay line having an output,

second isolation and attenuator means having an input fed by the output of said delay line and having an output feeding the second input to said double balanced mixer for transmitting the output of said delay line to the second input of the double balanced mixer,

said delay line and said second isolation and attenuator means having a combined delay, with reference to the delay of the first isolation means, which is at least three-quarters of the wavelength of the center frequency of said intermediate frequency signals and which is an integral odd multiple of said wavelength,

said double balanced mixer comprising:

(a) first and second transformers each having a primary and a secondary, said primaries respectively comprising said first and second inputs to the double balanced mixer,

(b) a bridge comprising four rectifiers connected together to form four junctions as follows: the first rectifier passing current from the first junction to the second junction, the second rectifier passing current from the second to the third junction, the third rectifier passing current from the third to the fourth junction, and the fourth rectifier passing current from the fourth junction to the first one,

(c) means connecting the secondary of said first transformer across said first and third junctions, and

(d) means connecting the secondary of said second transformer across said second and fourth junctions,

(e) each of said secondaries having a center-tap, whereby modulated signals, including the intelligence embodied in the modulation on the signals received from the satellite, appear across said two center taps, and

a load connected between said center-taps;

said heterodyne means and said limiter means including means for providing a sufficient level of power at said power splitter so that no additional amplification between the power splitter and said load is necessary; and said power splitter, said first and second isolation and attenuator means, said delay line, and said double balanced mixer processing the signals passing therethrough without amplification.

DESIGN PATENTS

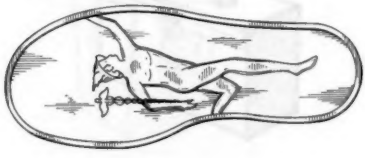
GRANTED SEP. 8, 1981

ERRATA

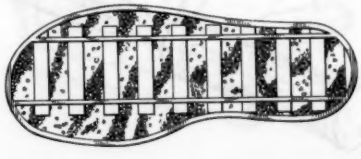
For CLASS	See PATENT NO.
D99–001	260,602
D99–049	260,603

260,570
SANDAL
James K. Wong, 46-194 Nona Loop, Kaneohe, Hi. 96744
Continuation-in-part of Ser. No. 722,615, Sep. 13, 1976, Pat. No. Des. 248,427. This application Jun. 19, 1978, Ser. No. 917,007
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270

260,571
SOLE OF A SHOE
David Greenblatt, Roslyn, and Rick Spinoza, Scarsdale, both of N.Y., assignors to AMFESCO Industries, Inc., Plainview, N.Y.
Filed May 4, 1979, Ser. No. 35,860
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—321

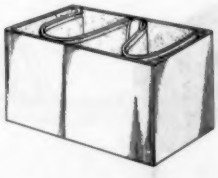


260,572
SOLE OF A SHOE
David Greenblatt, Roslyn, and Rick Spinoza, Scarsdale, both of N.Y., assignors to AMFESCO Industries, Inc., Plainview, N.Y.
Filed May 4, 1979, Ser. No. 36,047
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—321

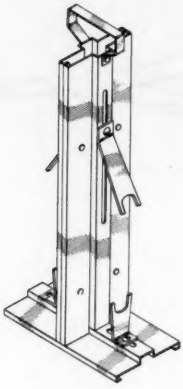


260,573
COMBINED TRACING WHEEL AND MARKING TOOL FOR DRESSMAKING
Leona R. Impastato, 27 Gray Rock La., Chappaqua, N.Y. 10514
Filed Oct. 18, 1978, Ser. No. 952,469
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—18

260,574
CAMERA AND LENS HOLDER
Miller Outcalt, 2036 Broadway, Santa Monica, Calif. 90404
Filed Sep. 28, 1979, Ser. No. 79,899
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—33

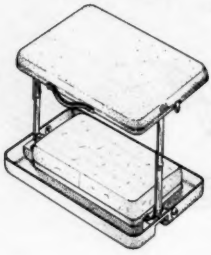


260,575
ROLLER SKATE CARRIER
Fred W. Brown, Jr., 1531 Minerva Ave., Anaheim, Calif. 92804
Filed Sep. 20, 1979, Ser. No. 77,082
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—36

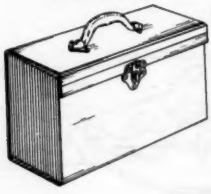


260,576
LADDER COVER
Lynn M. Roberdeaux, 10 Prince Ave., Kittery, Me. 03904
Filed Nov. 16, 1978, Ser. No. 961,219
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—41

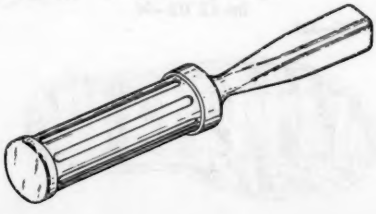
260,577
COMBINED COLLAPSIBLE BEACH REST AND CARRYING CASE
William V. Porter, P.O. Box 397, New Braunfels, Tex. 78130
Filed Sep. 17, 1979, Ser. No. 76,155
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—43



260,578
PORTABLE EXPANDING FILE CASE
Philip A. Cox, P.O. Box 189, West Heidelberg 3081, Victoria, Australia
Filed Dec. 18, 1978, Ser. No. 970,375
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—52

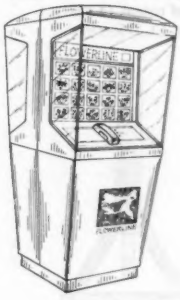


260,579
BRUSH HEAD AND HANDLE
Maurice C. Baudon, Beauvais, France, assignor to S. A. ets Lardenois, Hermes, France
Filed Oct. 4, 1979, Ser. No. 81,700
Claims priority, application France, Jul. 25, 1979, 79 296
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35

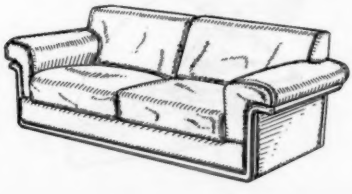


260,580
SWING SEAT
Paul K. Meeker, Kent, Ohio, assignor to Century Products, Inc., Cleveland, Ohio
Filed Nov. 16, 1978, Ser. No. 961,396
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—10

260,581
COMBINED MERCHANDISE ADVERTISING AND TELEPHONE ORDER BOOTH
Paul S. Kostoff, 24356 E. River Rd., Grosse Ile, Mich. 48318
Filed Sep. 28, 1978, Ser. No. 946,845
Term of patent 14 years
Int. Cl. D20—*02*; D25—*03*
U.S. Cl. D6—25

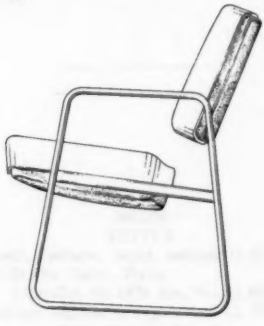


260,582
SOFA
Ernst Lüthy, Klingnau, Switzerland, assignor to C + D Consulting & Design AG, Engelberg, Switzerland
Filed May 21, 1979, Ser. No. 41,150
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

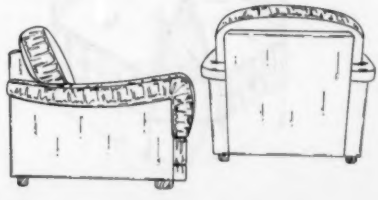


260,583
CHAIR FOR INVALIDS
William R. Brewer, 9100 Bartee Ave., Arleta, Calif. 91331
Filed Mar. 19, 1979, Ser. No. 21,627
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—64

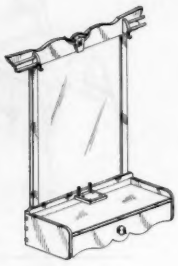
260,584
CHAIR
Don C. Albinson, Coopersburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 26, 1978, Ser. No. 909,748
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



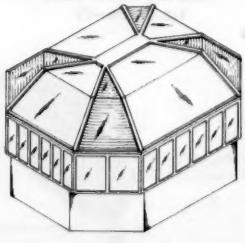
260,585
SEAT
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Mar. 5, 1979, Ser. No. 17,363
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



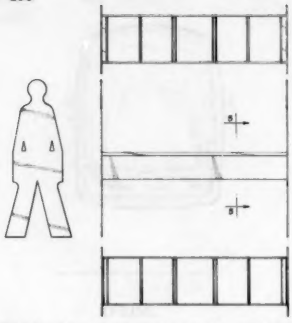
260,586
COMBINED VALET WALL RACK AND DRAWER UNIT
David Nusz, 2025 W. Mark, Layton, Utah 84041
Continuation-in-part of Ser. No. 974,128, Dec. 26, 1978, Pat. No. 257,303. This application Aug. 20, 1979, Ser. No. 67,837
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—123



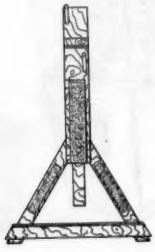
260,587
KIOSK
R. Michel Perlmutter, Aurora, Colo., assignor to Grove Foods, Inc., Aurora, Colo.
Filed Oct. 25, 1979, Ser. No. 84,896
Term of patent 14 years
Int. Cl. D6—*04*; D25—*03*
U.S. Cl. D6—146



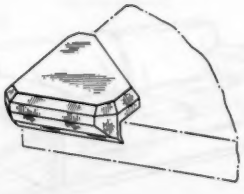
260,588
STORAGE CABINET
Kenneth E. Johnson, Sr., Waco, Tex., assignor to T-Shirts Plus, Inc., Waco, Tex.
Filed Sep. 13, 1979, Ser. No. 74,972
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—153



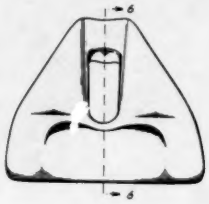
260,589
GUITAR STAND
Deborah J. O'Brien, 33 Mary St., South Burlington, Vt. 05401
Filed Sep. 11, 1978, Ser. No. 940,968
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—176



260,590
CORNER GUARD FOR FURNITURE
Haydn H. Hobson, 420 Reed Cir., Napa, Calif. 94558
Filed Jul. 6, 1979, Ser. No. 55,185
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

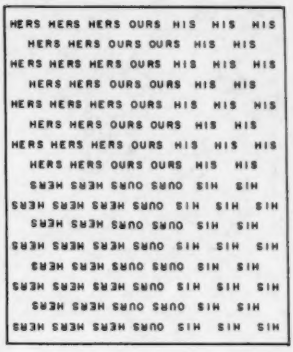


260,591
RELAXATION PAD
Clement G. Eischen, Sr., 1545 Lloyd Center, Portland, Oreg. 97232
Filed Jan. 16, 1978, Ser. No. 869,866
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201

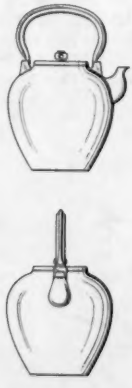


260,592
PLURAL MOUNT PICTURE FRAME
Sandra M. Comma, 2922 Stranden Rd., Baltimore, Md. 21230
Filed Jan. 17, 1980, Ser. No. 113,046
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

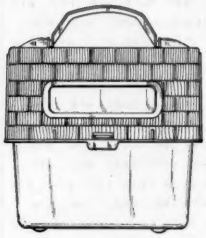
260,593
BED SHEET OR SIMILAR ARTICLE
Kevin D. Dolinar, Canonsburg, Pa.; Ruth M. Lipsitz, and Barry R. Lipsitz, both of Norwalk, Conn., assignors to Design Innovations, Norwalk, Conn.
Filed Nov. 19, 1979, Ser. No. 95,395
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—264

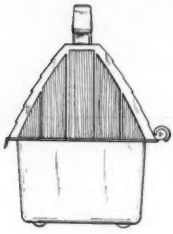


260,594
KETTLE
Kenichi Myodo, Tsubame, Japan, assignor to Shinko Kinzoku Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 10, 1979, Ser. No. 83,363
Claims priority, application Japan, Apr. 11, 1979, 54-014567
Term of patent 7 years
Int. Cl. D07—*02*
U.S. Cl. D7—66



260,595
LUNCH BOX
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Oct. 22, 1979, Ser. No. 87,242
Term of patent 14 years
Int. Cl. D03—*01*
U.S. Cl. D7—76



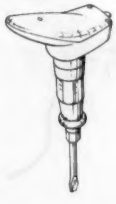


260,596
TRASH BAG HOLDER OR SIMILAR ARTICLE
Richard Vreeken, 1276 Metz Rd., Perris, Calif. 92370
Filed Oct. 25, 1979, Ser. No. 88,178
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—193

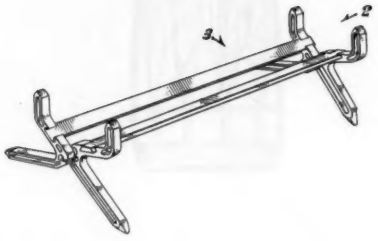
260,597
GREASE INJECTOR
Tokunari Mathuda, Kagamihara, Japan, assignor to Mathuda Chunyuki Kabushiki Kaisha, Gifu, Japan
Filed Mar. 22, 1979, Ser. No. 22,847
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14.1

260,598
MAGNETIC DEVICE FOR THE TEMPORARY FIXATION OF CERAMIC WELDING DUCTS TO STEEL SURFACES
Jakob van Steenwijk, Eelde, Netherlands, assignor to Varios Fabrieken B. V., Groningen, Netherlands
Filed Jul. 6, 1978, Ser. No. 922,390
Claims priority, application Benelux, Jan. 11, 1978, 52416
Term of patent 7 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

260,599
RATCHET SCREWDRIVER
Siu W. Wong, Kowloon, Hong Kong, assignor to Ching Wah Metal Ware Factory Limited, Kowloon, Hong Kong
Filed Mar. 19, 1979, Ser. No. 21,984
Term of patent 7 years
Int. Cl. D8—*04*
U.S. Cl. D8—82

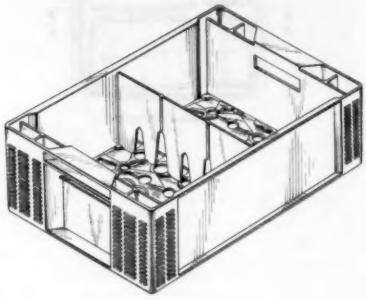


260,600
DRAIN HOSE SUPPORT FOR RECREATIONAL VEHICLES
Clyde B. Taylor, 1150 Hillcrest Dr., Pomona, Calif. 91768
Filed Mar. 19, 1979, Ser. No. 22,209
Term of patent 14 years
Int. Cl. D8—*08;* D12—*16*
U.S. Cl. D8—356

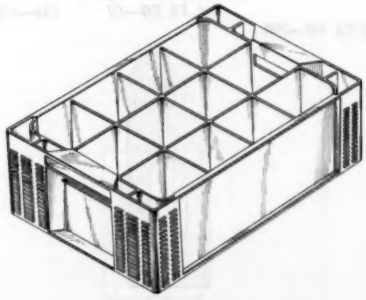


260,601
LIFTING HOOK
Yasuji Kawaguchi, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan
Filed Dec. 4, 1979, Ser. No. 100,238
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

260,602
BOTTLE AND CRATE CARRYING CASE
Marcel E. A. O'Donnal, Mexico City, Mexico, assignor to Plasticos Panamericanos, S.A. DE C.V., Mexico City, Mexico
Filed Jun. 29, 1978, Ser. No. 920,323
Claims priority, application Mexico, Feb. 16, 1978, 1904
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D99—49



260,603
BOTTLE CARRYING CASE
Marcel E. A. O'Donnal, Mexico City, Mexico, assignor to Plasticos Panamericanos, S.A. DE C.V., Mexico City, Mexico
Filed Aug. 22, 1978, Ser. No. 936,568
Claims priority, application Mexico, Feb. 23, 1978, 1912
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D99—49



260,604

INSULATED FOOD SERVICE TRAY AND COVER

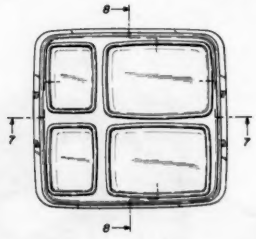
Edgar Otto, Scotch Plains, N.J., assignor to Therma-Tray Corporation, South Plainfield, N.J.

Filed Jun. 27, 1978, Ser. No. 919,708

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—347



260,605

LIQUID DISPENSER

David T. Saunders, P.O. Box 32406, Tel-Aviv, Israel

Filed Apr. 26, 1978, Ser. No. 900,201

Claims priority, application United Kingdom, Nov. 4, 1977, 982170

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—300

260,606

BOTTLE

Ronald Sacks, 4233 Karensue Ave., San Diego, Calif. 92122

Filed May 10, 1979, Ser. No. 38,001

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—309

260,607

CONTAINER FOR LIQUID

Raymond P. Stoy, Westport, Conn., assignor to American Home Products Corp., New York, N.Y.

Filed Mar. 23, 1979, Ser. No. 23,123

Term of patent 14 years

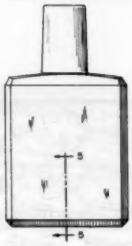
Int. Cl. D9—*01*

U.S. Cl. D9—389

260,608
JAR
James R. McKee, Jr., Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.
Filed Sep. 18, 1979, Ser. No. 76,777
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—394

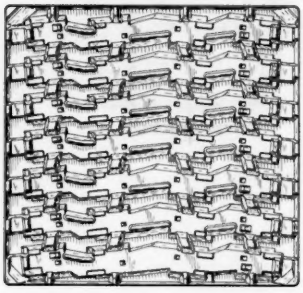
260,609
BOTTLE
Andre Courreges, 27 rue Delabordere, Neuilly sur Seine, Hauts de Seine, France
Filed Nov. 3, 1978, Ser. No. 957,415
Claims priority, application France, May 3, 1978, 78 41341
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—403

260,610
COMBINED BOTTLE AND CAP
John A. Grip, Cheesequake, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed May 10, 1978, Ser. No. 904,721
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—413

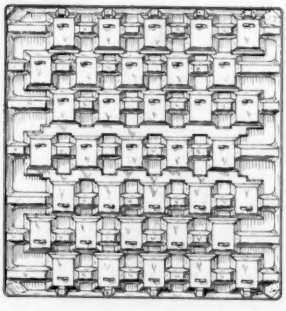


260,611
BOTTLE
Jose L. Balcells, Coral Gables, Fla., assignor to Conqueror (Wine & Spirit) & Co., Limited, London, England
Filed May 30, 1978, Ser. No. 910,878
Claims priority, application United Kingdom, Nov. 29, 1977, 982419/77
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—413

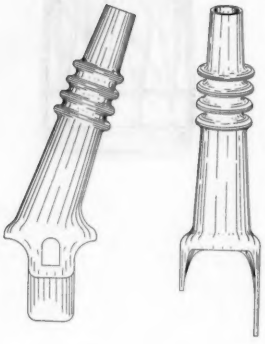
260,612
SHIPPING TRAY FOR DYNAMOELECTRIC MACHINES
Harold E. Wilkerson, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.
Filed Jul. 13, 1979, Ser. No. 57,301
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—424



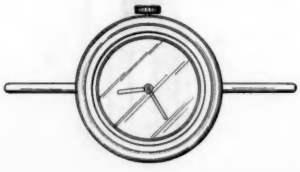
260,613
SHIPPING TRAY FOR DYNAMOELECTRIC MACHINES
Harold E. Wilkerson, De Kalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.
Filed Jul. 13, 1979, Ser. No. 57,302
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—424



260,614
POURING SPOUT FOR A FLUID CONTAINER
Bengt O. Petersson, Stutaliden 33, S-434 00 Kungsbacka, Sweden
Filed Feb. 2, 1979, Ser. No. 8,969
Claims priority, application Sweden, Aug. 7, 1978, 1978181
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—447



260,615
COMBINED WRISTWATCH AND BAND
Carlo Maroni, No. 24, Via Rodolfo Benini, 00191 Rome, Italy
Filed Oct. 17, 1978, Ser. No. 952,137
Claims priority, application Italy, Apr. 17, 1978, 35775/78[U]
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32

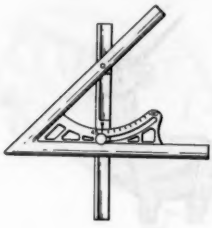


260,616

ADJUSTABLE CARPENTERS SQUARE

Richard A. Groves, 10141 Kilborne Rd., Rte. #2, Sunbury, Ohio 43074

Filed Jun. 15, 1979, Ser. No. 48,848
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65

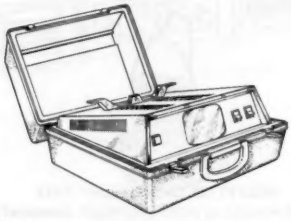


260,617

PORTABLE ELECTRONIC TESTER AND ANALYZER

Phillip N. Lawson, II, Anoka, and James A. Odom, Jr., Apple Valley, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 21, 1979, Ser. No. 96,585
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—76

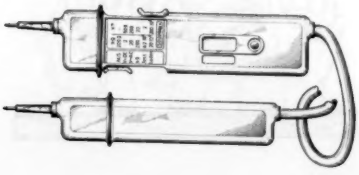


260,618

ELECTRICAL TESTING INSTRUMENT

Manfred Koslar, No. 16, Schröder Strasse, 4840 Rheda-Wiedenbrück, Fed. Rep. of Germany

Filed May 8, 1979, Ser. No. 37,192
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 1111
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

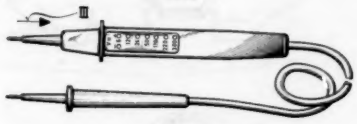


260,619

ELECTRICAL TESTING INSTRUMENT

Manfred Koslar, No. 16, Schröder Strasse, 4840 Rheda-Wiedenbrück, Fed. Rep. of Germany

Filed May 8, 1979, Ser. No. 37,193
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 1111
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78



260,620

COMBINED LOCKABLE BRACELET AND KEY THEREFOR

Pierre-Alain Blum, La Chaux-de-Fonds, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland

Filed Dec. 19, 1978, Ser. No. 970,960
Claims priority, application Switzerland, Jun. 19, 1978, 67104
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

260,621

SEGMENTAL NECKLACE

Marina Bulgari, Nafpaktos, Greece, assignor to Zoldia Anstalt, Vaduz, Liechtenstein

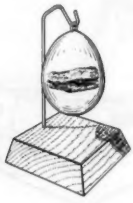
Filed Feb. 21, 1979, Ser. No. 13,316
Claims priority, application Switzerland, Aug. 24, 1978, 110059
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—5

260,622
CLASP EARRING
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Sep. 12, 1979, Ser. No. 74,888
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75

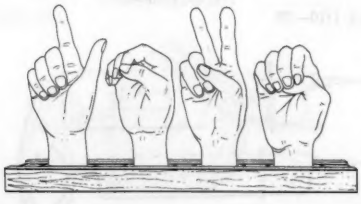
260,623
STATUE
Richard S. Gorski, 11312 Grand Oak Dr., B-18 A-10, Grand Blanc, Mich. 48439
Filed Apr. 3, 1978, Ser. No. 893,149
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

260,624
FIGURINE OF AN ANTELOPE
Jesus A. C. Santa Eulalia, and Javier B. C. Santa Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Sep. 29, 1978, Ser. No. 946,850
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

260,625
NOVELTY STATUETTE
Robert M. Schoolcraft, 354 Grand Blvd., San Mateo, Calif. 94401
Filed Sep. 4, 1979, Ser. No. 71,881
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131

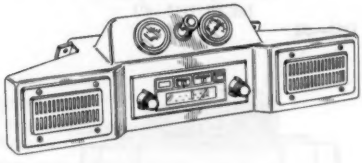


260,626
NOVELTY FIGURINE
Gabor Kadar, 4635 White Oak Ave., Encino, Calif. 91316
Filed Oct. 25, 1979, Ser. No. 87,825
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

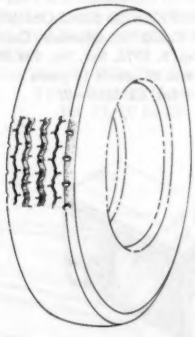


260,627
AUTOMOBILE
Morley L. Smith, Jr., Beaconsfield, Canada, assignor to Guillon, Smith, Marquart & Asso. Ltd., Montreal, Canada
Filed May 14, 1979, Ser. No. 38,869
Claims priority, application Canada, May 2, 1979, 02-05-79-1
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91

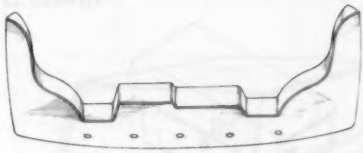
260,628
MOTORCYCLE CONSOLE
Robert K. McKeel, 415 Mulberry St., Beaver, Pa. 15009
Filed Apr. 20, 1978, Ser. No. 898,526
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



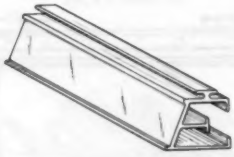
260,629
TIRE TREAD AND BUTTRESS
Philip S. Hammond, Mogadore, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 16, 1979, Ser. No. 21,033
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



260,630
OVERHEAD CONSOLE FOR VEHICLES
Thomas L. Drafton, 4335 N. Peck, El Monte, Calif. 91731
Filed Apr. 17, 1979, Ser. No. 30,834
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

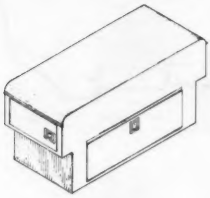


260,631
SIDE RAIL FOR A LAND VEHICLE LUGGAGE RACK
Daniel J. Kowalski, Ortonville, Mich., assignor to Four Star Corporation, Troy, Mich.
Filed Mar. 9, 1979, Ser. No. 19,274
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

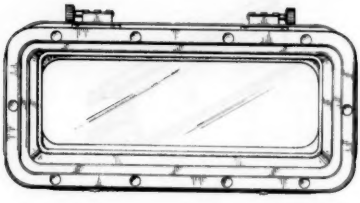


260,632
LUGGAGE RACK
Robert A. Noga, 13404 Calais Dr., Del Mar, Calif. 92014
Filed Mar. 28, 1979, Ser. No. 24,700
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

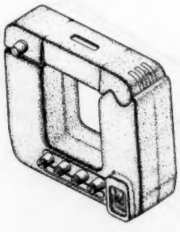
260,633
SERVICE BOX FOR A PICKUP TRUCK
Ronald D. Gorman, R.R. #2, Thunder Bay, Ontario, Canada (P7C 4U1)
Filed Jan. 9, 1980, Ser. No. 110,624
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



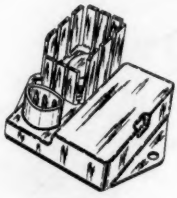
260,634
PORTHOLE
John I. Gates, Newport Beach, Calif., assignor to Clifford C. Oliver, Newport Beach, Calif., a part interest
Filed Mar. 8, 1979, Ser. No. 18,856
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—183



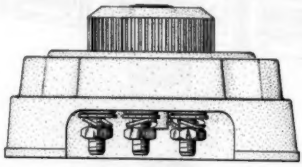
260,635
SPLIT CORE CURRENT TRANSFORMER
David L. Lockwood, Williamsville, N.Y., assignor to Clarence Controls Inc., Buffalo, N.Y.
Filed Aug. 23, 1979, Ser. No. 68,945
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—4



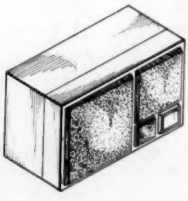
260,636
HOUSING FOR AN ELECTRONIC IGNITION CONTROL UNIT
George K. Duden, Royal Oak, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Aug. 3, 1978, Ser. No. 930,821
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—15



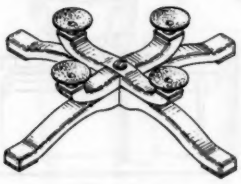
260,637
BOAT SAFETY MAIN SWITCH
Leroy F. Hollenbeck, Jr., Miami, Fla., assignor to Perko, Inc., Miami, Fla.
Filed Aug. 22, 1979, Ser. No. 68,814
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



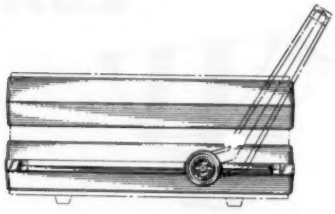
260,638
LOUDSPEAKER ENCLOSURE
Charles Barbera, 303 E. Elk St., Glendale, Calif. 91205
Filed Sep. 5, 1978, Ser. No. 939,890
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33



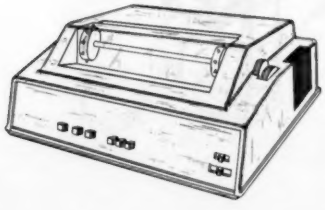
260,639
INSULATING SPEAKER SUPPORT
Barry W. Long, 10193 Parish Pl., Cupertino, Calif. 95014
Filed May 30, 1978, Ser. No. 910,487
Term of patent 14 years
Int. Cl. D14—*99;* D15—*01*
U.S. Cl. D14—38



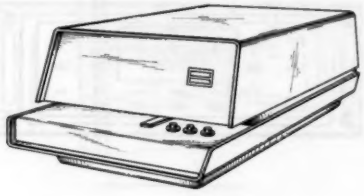
260,640
SIDE PANELS ASSEMBLY FOR READILY DISASSEMBLED INSTRUMENT HOUSING
Peter A. Peroni, Pottstown, Pa., assignor to LaFrance Corporation, Philadelphia, Pa.
Filed May 10, 1979, Ser. No. 37,673
Term of patent 14 years
Int. Cl. D14—*99;* D10—*07*
U.S. Cl. D14—114



260,641
CABINET FOR AN INPUT-OUTPUT TERMINAL FOR A DATA HANDLING SYSTEM
Bruce B. Campbell, Chesapeake, and Charles E. Milliser, Waynesboro, both of Va., assignors to General Electric Company, Waynesboro, Va.
Filed Dec. 28, 1978, Ser. No. 974,208
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—105

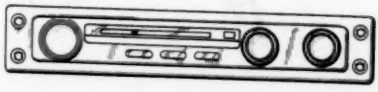


260,642
FORM PRINTER
Kenneth D. Collister, Elkhart, Ind., and James R. Flood, Edwardsburg, Mich., assignors to Miles Laboratories, Inc., Elkhart, Ind.
Filed Jun. 21, 1979, Ser. No. 50,676
Term of patent 14 years
Int. Cl. D14—*02;* D18—*02*
U.S. Cl. D14—111



260,643
BASE FOR A TELEPHONE SET
Donald Foggia, Ocean, N.J., and Roman Pomponi, Norwalk, Conn., assignors to TIE/Communications, Inc., Shelton, Conn.
Filed Aug. 24, 1978, Ser. No. 936,335
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

260,644
AUTOMOBILE RADIO RECEIVER
Toshiyoshi Kikuhara, Soka, Japan, assignor to Clarion Co. Ltd., Tokyo, Japan
Filed Nov. 1, 1979, Ser. No. 90,455
Claims priority, application Japan, Jun. 12, 1979, 54-24324
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



260,645

AUTOMOBILE RADIO RECEIVER

Toshiyoshi Kikuhara, Naka, Japan, assignor to Clarion Co. Ltd., Tokyo, Japan

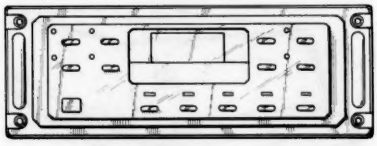
Filed Nov. 7, 1979, Ser. No. 91,947

Claims priority, application Japan, Jun. 22, 1979, 54-26309

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—70



260,646

COMBINED RADIO, CLOCK AND CALCULATOR

Toshimasa Akazawa, Machida; Kikuo Ohta, Ikoma; Toshio Igo, Hirakata, and Benito Mishiro, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 30, 1979, Ser. No. 99,189

Claims priority, application Japan, May 31, 1979, 54-22452

Term of patent 14 years

Int. Cl. D14—*03;* D10—*01;* D18—*01*

U.S. Cl. D14—73

260,647

CAMERA FOR VIDEO TAPE RECORDER

Taisuke Saeki; Masaharu Katayama; Yoshinobu Kitakaze; Noriyuki Arai; Hideo Takahashi; Koya Kurokawa, and Norihiko Shimose, all of Saijyo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

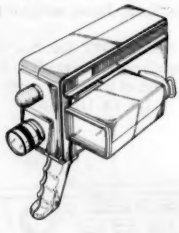
Filed Dec. 11, 1978, Ser. No. 968,246

Claims priority, application Japan, Jun. 9, 1978, 53-24068

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—78



260,648

SEWING MACHINE

Eric J. Marshall, Flat 8, 5 Carlton Gardens, London S.W.1, England

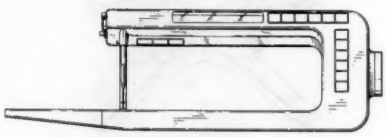
Filed Mar. 23, 1979, Ser. No. 23,315

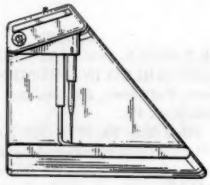
Claims priority, application United Kingdom, Nov. 25, 1978, 987429/78

Term of patent 14 years

Int. Cl. D15—*06*

U.S. Cl. D15—69





260,649

HOT AIR CORN POPPER

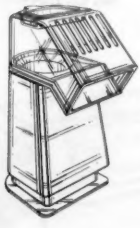
M. James Wondergem, West Bend, Wis., assignor to D.rt Industries Inc., Los Angeles, Calif.

Filed May 11, 1979, Ser. No. 37,983

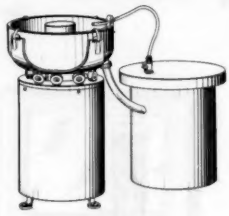
Term of patent 14 years

Int. Cl. D15—*08*

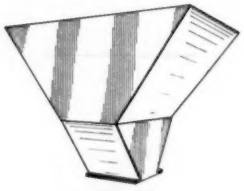
U.S. Cl. D15—105



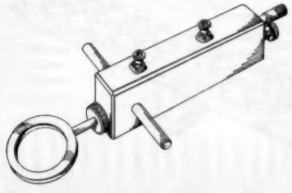
260,650
VIBRATORY FINISHING MACHINE
Steven A. Alviti, Cranston, R.I., assignor to Bel-Air Tool Corp., Warwick, R.I.
Filed Mar. 19, 1979, Ser. No. 21,953
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—147



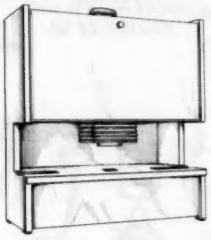
260,651
HOPPER FOR AN INSULATION BLOWING MACHINE AND THE LIKE
Robert R. Gibbons, Westminster, Colo., assignor to Insulation Technology Corporation, Northglenn, Colo.
Filed Feb. 27, 1978, Ser. No. 881,833
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—199



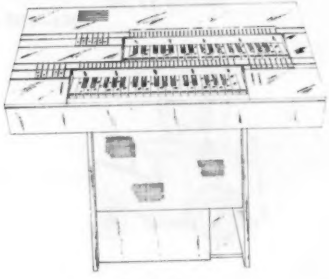
260,652
HAND-HELD HOMOGENIZER
Walter D. Kirkland, 317 Conifer Ct., Walnut Creek, Calif. 94598
Filed Oct. 2, 1978, Ser. No. 948,002
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199



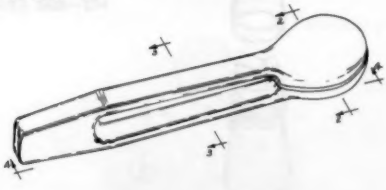
260,653
PHOTOGRAPHIC PRINTING APPARATUS
Donald R. Harrigan, P.O. Box 1598, Atlantic City, N.J. 08404
Filed Jan. 22, 1979, Ser. No. 5,177
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—27



260,654
ELECTRONIC ORGAN
Luciano Antonelli, Osimo, Italy, assignor to F. lli Antonelli s.n.c. del. Cav. Luigi Antonelli & C., Osimo, Italy
Filed Apr. 24, 1979, Ser. No. 33,007
Claims priority, application Italy, Dec. 4, 1978, 23459/78[U]
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D17—6



260,655
MUSICAL SPOON
Germaine Guay, 835 Gardendale, Ferndale, Mich. 48220
Filed Oct. 31, 1979, Ser. No. 89,807
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22

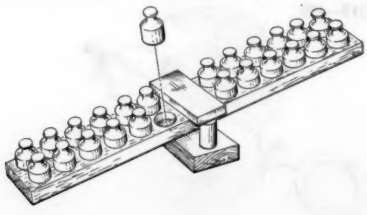


260,656
FELT PEN
Tatsuro Funahashi, Komaki, Japan, assignor to Shachihata Industrial Co., Ltd., Nagoya, Japan
Filed Oct. 4, 1979, Ser. No. 81,913
Claims priority, application Japan, Apr. 9, 1979, 54-14301
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—43

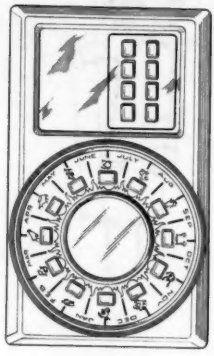
260,657
FELT PEN
Tatsuro Funahashi, Komaki, Japan, assignor to Shachihata Industrial Co., Ltd., Nagoya, Japan
Filed Oct. 4, 1979, Ser. No. 81,918
Claims priority, application Japan, Apr. 9, 1979, 54-14302
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—43

260,658
FOUNTAIN PEN
Shigeki Chiba, Nakai, Japan, assignor to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 14, 1979, Ser. No. 94,398
Claims priority, application Japan, May 30, 1979, 54-21745
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—49

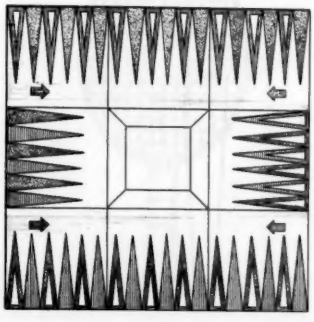
260,659
BALANCE GAME APPARATUS
Larry Stockard, #6 Leacrest, North Little Rock, Ark. 72116
Filed Jun. 4, 1979, Ser. No. 45,083
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59



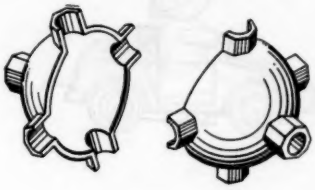
260,660
ELECTRONIC HOROSCOPE GAME CASING OR SIMILAR ARTICLE
Edward Mayer, Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Jan. 5, 1979, Ser. No. 1,233
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



260,661
BACKGAMMON GAMEBOARD
Robert M. Thomas, 2970 Menson Rd.-15, Cumberland, R.I. 02864, and Robert E. Thomas, R.D.-3 Acorn St., Stanhope, N.J. 07874
Filed Aug. 6, 1979, Ser. No. 63,492
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D21—34



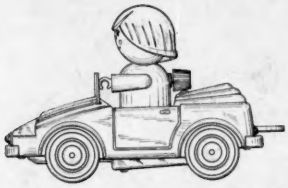
260,662
TOY CONSTRUCTION PIECE
Hiroyuki Hida, Tokyo, Japan, assignor to Mitsubishi Pencil Co. Ltd., Tokyo, Japan
Division of Ser. No. 657,256, Feb. 11, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,925
Claims priority, application Japan, Sep. 1, 1975, 50/35263
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—108



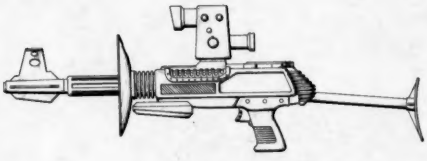
260,663
COMBINED TOY GOLF CART AND FIGURE THEREFOR
Naoharu Yamashina, Tokyo, Japan, assignor to Kabushiki Kaisha Bandai Overseas, Tokyo, Japan
Filed Feb. 5, 1979, Ser. No. 9,051
Claims priority, application Japan, Aug. 10, 1978, 53-33917
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134

260,664
COMBINED TOY SHOPPING CAR AND FIGURE THEREFOR
Naoharu Yamashina, Tokyo, Japan, assignor to Kabushiki Kaisha Bandai Overseas, Tokyo, Japan
Filed Feb. 5, 1979, Ser. No. 9,054
Claims priority, application Japan, Aug. 10, 1978, 33914/78
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134

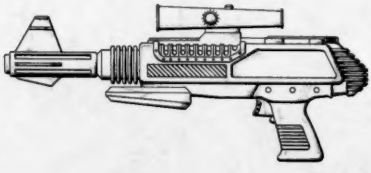
260,665
COMBINED TOY SPORTS CAR AND FIGURE THEREFOR
Naoharu Yamashina, Tokyo, Japan, assignor to Kabushiki Kaisha Bandai Overseas, Tokyo, Japan
Filed Feb. 5, 1979, Ser. No. 9,050
Claims priority, application Japan, Aug. 10, 1978, 33918/78
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—136



260,666
TOY LASER WEAPON
Jerry M. McAlpin, P.O. Box 7, Bullard, Tex. 75757, and Danny R. Waites, Rte. 1, Jacksonville, Tex. 75766
Filed Apr. 10, 1979, Ser. No. 28,832
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—146



260,667
TOY LASER PISTOL
Jerry M. McAlpin, P.O. Box 7, Bullard, Tex. 75757, and Danny R. Waites, Rte. 1, Jacksonville, Tex. 75766
Filed Apr. 10, 1979, Ser. No. 28,831
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—147



260,668
DOLL
Mary A. Martin, 71 Pandora Cir., Scarborough, Ontario, Canada (M1H 1V6)
Filed Feb. 23, 1979, Ser. No. 14,615
Claims priority, application Canada, Aug. 30, 1978, 3008782
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—171

260,669
BASKETBALL RETURN FOR ATTACHMENT TO BASKETBALL HOOPS
Jerry A. Armstrong, Glenburn, N. Dak., assignor to Super Hooper Corporation, Minot, N. Dak.
Filed Oct. 12, 1979, Ser. No. 84,132
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—201

260,670

BASKETBALL RETURN FOR ATTACHMENT TO BASKETBALL HOOPS

Jerry A. Armstrong, Glenburn, N. Dak., assignor to Super Hooper Corporation, Minot, N. Dak.

Filed Oct. 12, 1979, Ser. No. 84,133

Term of patent 14 years

Int. Cl. D21—*02*

U.S. Cl. D21—201

260,671

PLASTIC RACKET

Yuk Fai Lau, Kowloon, Hong Kong, assignor to Lau Tak Shing t/a Tai Way Shing Kee Plastic & Metal Manufactory, Kowloon, Hong Kong

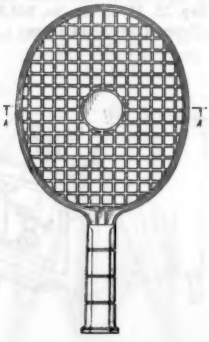
Filed Oct. 1, 1979, Ser. No. 81,074

Claims priority, application United Kingdom, Jul. 3, 1979, 990572/79

Term of patent 14 years

Int. Cl. D21—*02*

U.S. Cl. D21—212



260,672

COMBINED GOLF BALL MARKER AND CARD HOLDER

Bob E. Gardner, 1532 Cape Cod Cir., Alabaster, Ala. 35007

Filed Jun. 19, 1979, Ser. No. 50,073

Term of patent 14 years

Int. Cl. D21—*02*

U.S. Cl. D21—234

260,673

PLAYGROUND SWING

Donald S. Ament, Encino, and Duane S. Ament, Hollywood, both of Calif., assignors to Miracle Recreation Equipment Company, Grinnell, Iowa

Filed Sep. 20, 1979, Ser. No. 77,361

Term of patent 14 years

Int. Cl. D21—*03*

U.S. Cl. D21—246

260,674

ARCHER'S BOW HOLDER

Bruce D. Simmons, Rte. 7, Box 383, and William A. Sircy, Rte. 7, Clark St., both of Franklin, Ky. 42134

Filed Dec. 13, 1979, Ser. No. 103,553

Term of patent 14 years

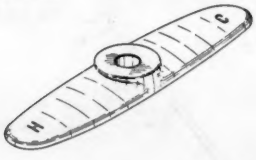
Int. Cl. D22—*05*

U.S. Cl. D22—13

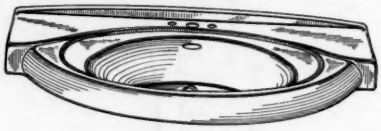
260,675
FISHING ROD GRIP
Etsuo Hiraishi, Hiroshima, and Masakazu Sakamoto, Fukuyama, both of Japan, assignors to Ryobi Ltd., Fuchu, Japan
Filed Oct. 2, 1979, Ser. No. 81,283
Claims priority, application Japan, Apr. 2, 1979, 54-13395
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

260,676
FISHING ROD GRIP
Etsuo Hiraishi, Hiroshima, and Masakazu Sakamoto, Fukuyama, both of Japan, assignors to Ryobi Ltd., Fuchu, Japan
Filed Oct. 2, 1979, Ser. No. 81,284
Claims priority, application Japan, Apr. 2, 1979, 54-13394
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

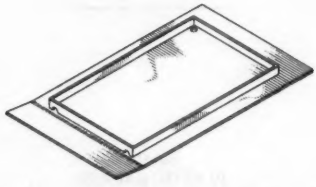
260,677
BASE PLATE FOR FAUCET
Gilles Thevenot, Baden-Baden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik, Hemer, Fed. Rep. of Germany
Filed Jul. 23, 1979, Ser. No. 59,510
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1979, MR 6903
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32



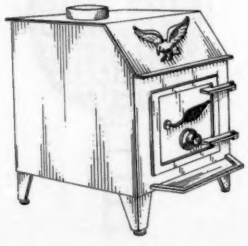
260,678
LAVATORY OR SIMILAR ARTICLE
Dorothee Hiller, Stuttgart, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.
Filed Aug. 10, 1979, Ser. No. 65,674
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 20 MR 1848
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—53



260,679
SOLAR COLLECTOR CELL CONTAINER AND ROOF FLASHING ASSEMBLY
Myron D. Mayerovitch, Yorba Linda, Calif., assignor to Steve Frank Mayer, Yorba Linda, Calif.
Filed Jul. 13, 1978, Ser. No. 924,456
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—72

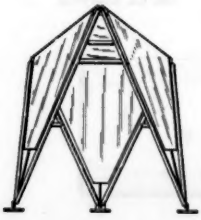


260,680
WOOD BURNING STOVE
Edmund P. Bullard, Sr., R.D. 2, Lyons, N.Y. 14489, and Gary A. Togni, 402 Palmer Dr., North Syracuse, N.Y. 13212
Filed Sep. 25, 1978, Ser. No. 945,571
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

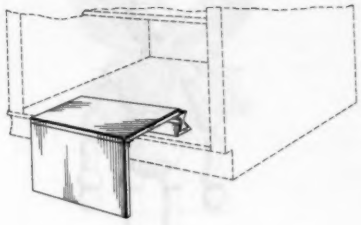


260,681
RETENTION SUTURE BRIDGE
Ingram S. Chodorow, Upper Saddle River, N.J., and J. David Dainow, New York, N.Y., assignors to Technalytics, Inc., Upper Saddle River, N.J.
Filed Jan. 2, 1979, Ser. No. 286
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—27

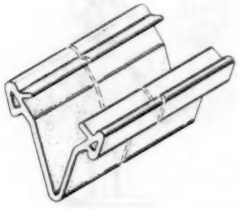
260,682
MODIFIED OCTAHEDRAL SHELTER
Harry Vest, 1764 Northwest Blvd., Apt. C, Columbus, Ohio 43212
Filed Dec. 10, 1979, Ser. No. 102,029
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—23



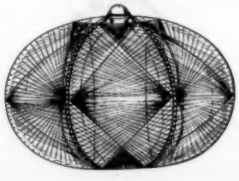
260,683
FOLDING CABINET STEP
Vera Kokoska, 310 Clark St., Hot Springs, Ark. 71901
Filed May 15, 1979, Ser. No. 39,111
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D25—65



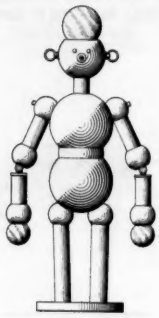
260,684
EXPANSION JOINT SEALING STRIP FOR ROADWAY JOINTS
William E. Bowman, Englewood, Colo., assignor to Bowman Construction Supply, Inc., Denver, Colo.
Filed Nov. 30, 1979, Ser. No. 98,808
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



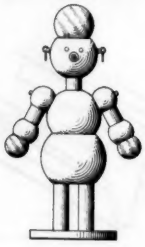
260,685
LUMINAIRE
Frederic Zurcher, Le Paquis, St. Julien en Genevois, France (74160)
Filed May 23, 1978, Ser. No. 908,840
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—91



260,686
DECORATIVE ELECTRIC LAMP
George Atrio, 8075 W. 20 Ave., Hialeah, Fla. 33014
Filed Jan. 29, 1979, Ser. No. 6,993
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—99

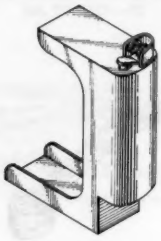


260,687
DECORATIVE ELECTRIC LAMP
George Atrio, 8075 W. 20 Ave., Hialeah, Fla. 33014
Filed Apr. 9, 1980, Ser. No. 138,496
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—99



260,688
LAMP BALLAST
Joseph P. Wotowiec, Cuyahoga Falls, Ohio, and Thurman Bowls, New Smyrna Beach, Fla., assignors to General Electric Company, Schenectady, N.Y.
Filed Sep. 21, 1978, Ser. No. 944,920
Term of patent 14 years
Int. Cl. D26—*99*
U.S. Cl. D26—142

260,689
COMBINED DISPOSABLE CIGARETTE LIGHTER AND CIGARETTE PACKAGE HOLDER
Bobby D. Storms, Rte. 2, Box 427, Bladenboro, N.C. 28320
Filed Sep. 13, 1978, Ser. No. 941,889
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—37



260,690
LIGHTER
Franz A. Stützer, Mühlheim, Fed. Rep. of Germany, assignor to Rowenta-Werke, GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Aug. 3, 1978, Ser. No. 930,626
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1978, 510076
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

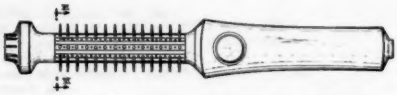
260,691
SOAP BAR OR SIMILAR ARTICLE
Robert Hines, Basking Ridge, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 27, 1978, Ser. No. 946,304
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D28—8.1

260,692

CURLING IRON

William J. Rakocy, Nutley, and Ronald L. Muller, New Milford, both of N.J., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,708
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35



260,693

HAIR ORNAMENT

William C. Payne, 3755 E. 23rd. St., and Ellen L. Patterson, 1244 S. Normount, both of Tucson, Ariz. 85713

Filed Nov. 23, 1979, Ser. No. 96,923
Term of patent 3½ years
Int. Cl. D11—*01*
U.S. Cl. D28—41

260,694

BACK SCRATCHER

Mervin E. Mallett, P.O. Box 394, Crystal Bay, Nev. 89402

Filed Nov. 13, 1979, Ser. No. 93,286
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—99

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF SEPTEMBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Cale, Albert D., Jr., 4,288,591, Cl. 544-139.000.

A.P.V. Company Limited, The: *See—*
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A. Raymond: *See—*
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Abe, Haruo: *See—*
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Abel, Heinz, to Ciba-Geigy Corporation. Process for slop-padding textile cellulose material. 4,288,226, Cl. 8-496.000.

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ACF Chemiefarma N.V.: *See—*
Akkerman, Antony M.; van Bakel, Hermanus C. C. K.; and Van Breevoort-Uurbanus, Henriette G., 4,288,444, Cl. 424-267.000.

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Aerojet-General Corporation: *See—*
Buckmann, Paul S., 4,288,202, Cl. 415-142.000.

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Ishida, Masahiko; Haga, Ryoichi; and Odawara, Yoji, 4,288,550, Cl. 435-167.000.
Otsu, Nobuyuki; Mori, Shunji; and Saito, Taiichi, 4,288,779, Cl. 340-146.30Y.
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Agfa-Gevaert Aktiengesellschaft: *See—*
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Ahn, Byung D. Lock using non-rotating perforated plate key. 4,287,737, Cl. 70-467.000.

Aho, Yrjo, to Exel Oy. Ski stick handle. 4,288,101, Cl. 280-821.000.

Aho, YrjoKuninkaantie. Buckle and strap and method for the manufacture thereof, especially hand strap and buckle for a ski stick. 4,288,100, Cl. 280-821.000.

Ahrons, Richard W., to Motorola, Inc. High-impedance IGFET input circuit suitable for smoke detector I.C. 4,288,694, Cl. 250-374.000.

Aiba, Masahiko; and Umeda, Ikuo, to Sharp Kabushiki Kaisha. Phase detection in an ink jet system printer of the charge amplitude controlling type. 4,288,796, Cl. 346-75.000.

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Geiger, Robert G., 4,288,119, Cl. 292-262.000.

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Aisin Seiki Kabushiki Kaisha: *See—*
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Akao, Hisataro, to Daicel Chemical Industries Ltd. Apparatus for continuously producing pleated semipermeable membrane elements. 4,288,278, Cl. 156-474.000.

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Guthart, Leo A., 4,288,867, Cl. 367-93.000.

Albert, Judith; and Davis, Robert E., to Ideal Toy Corporation. Toy doll and accessory. 4,287,681, Cl. 46-44.000.

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Alfter, Franz-Werner; and Breitscheidel, Hans-Ulrich, to Dynamit Nobel Aktiengesellschaft. Engine hood lining for automotive vehicles. 4,288,490, Cl. 428-315.000.

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Allen, Paul E., to Logic Devices, Inc. Plastic mold negative pressure cooling system. 4,287,941, Cl. 165-70.000.

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Alps Electric Co., Ltd.: *See—*
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Lutz, Albert W.; and Diehl, Robert E., 4,288,385, Cl. 260-465.00E.
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Anderson, Burton C.; and Uschold, Ronald E., to Du Pont de Nemours, E. I., and Company. Fluorinated phenoxypropyl vinyl ether polymer. 4,288,574, Cl. 525-331.000.

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Kikuchi, Hideo; Takaoka, Haruyoshi; and Baba, Shigenori, 4,288,804, Cl. 357-42.000.

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Babcock & Wilcox Company, The: *See*—
Searles, William K.; Searles, Richard J.; and Searles, Kenneth R., 4,288,020, Cl. 228-7.000.

Babigian, Dickran: *See*—
MacDonald, Paul M., 4,288,137, Cl. 312-341.00R.

Bachrach, Benjamin I.; and Fuhrman, William J., to Ford Motor Company. Tapered extrusion die and method of forming the same. 4,287,749, Cl. 72-467.000.

Bader, Ronald S.; Rennick, Lyle V.; and Wallis, Robert H., to Compression Labs, Inc. High speed character matcher and method. 4,288,782, Cl. 340-146.30Q.

Baer, John S., to Rainwise, Inc. Digital weather station. 4,287,762, Cl. 73-170.00R.

Baer, Ted A.: *See*—
Kohn, Gustave K.; and Baer, Ted A., 4,288,621, Cl. 564-190.000.

Baetke, Russell E., to Boeing Company, The. Self-rigging cable control system and process. 4,287,788, Cl. 74-501.50R.

Bafunno, Daniel V.: *See*—
Vazquez-Cuervo, Alfonso; Richards, Frederick T.; Bafunno, Daniel V.; and Papacostas, George, 4,288,726, Cl. 318-54.000.

Baichtal, James R.: *See*—
McDonald, John C.; Baichtal, James R.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig P., 4,288,870, Cl. 370-56.000.

Bajusz, Sandor; Ronay, Andras; and Szekely, Jozsef, to Richter Gedeon Vegyeszeti Gyar Rt. Novel enkephalin analogs and process for the preparation thereof. 4,288,432, Cl. 424-177.000.

Baker, Don R.; and Teach, Eugene G., to Stauffer Chemical Company. Cyclohexane carbonyloxybromoacetanilide. 4,288,605, Cl. 560-1.000.

Baker, Donald B., to Pro-Mark Companies, The. Low fat imitation sour cream. 4,288,459, Cl. 426-43.000.

Baker, Edward G.; and Huang, John S., to Exxon Research & Engineering Co. Gas pre-injection for chemically enhanced oil recovery. 4,287,950, Cl. 166-273.000.

Baker, Larry R., to Textron, Inc. Filament-type trimmer. 4,287,670, Cl. 30-276.000.

Baker, Leroy E.; and Butterfield, Barry L., to Henningson, Durham & Richardson, Inc. Reticulately reinforced earthen dams and method for providing reinforcement. 4,288,175, Cl. 405-117.000.

Balchem Corporation: *See*—
Ciliberto, Paul; and Kramer, Stanley, 4,288,460, Cl. 426-96.000.

Baldwin, Robert J., to Lynfield, H. Geoffrey. Filing systems and other collapsible structural units. 4,288,130, Cl. 312-183.000.

Bangor Punta Corporation: *See*—
Kruger, James B., 4,287,731, Cl. 70-16.000.

Banski, Thomas J.; and Riedner, Robert J., to Outboard Marine Corporation. Separation of aluminum from articles composed of aluminum bonded to ferrous metal. 4,288,246, Cl. 75-68.00R.

Barber, Donald T., to Datafile Limited. File binding system. 4,288,170, Cl. 402-17.000.

Barnes, Edward, to BP Nutrition (UK) Limited. Fish silage. 4,288,458, Cl. 426-7.000.

Barrett, David M.: *See*—
Grass, Joseph J.; Barrett, David M.; and Wendt, Randolph N., 4,288,700, Cl. 250-523.000.

Barrett, Steven P.; and Nelson, William J., to Standard Brands Incorporated. Process for isomerizing glucose to fructose. 4,288,548, Cl. 435-94.000.

Barske, Heiko, to Audi Nsu Auto Union. Mechanism for regulating a wiper motor in a vehicle. 4,288,705, Cl. 307-10.00R.

Barthel, Alfred, to Union Carbide Corporation. Cryogenic liquid container. 4,287,720, Cl. 62-45.000.

BASF Aktiengesellschaft: *See*—
Bliesener, Jens-Uwe; Geiss, Karl-Heinz; Lenke, Dieter; and Mueller, Claus D., 4,288,449, Cl. 424-274.000.
Nissen, Axel; Rebafka, Walter; and Aquila, Werner, 4,288,636, Cl. 568-486.000.
Schuster, Ludwig; Raff, Paul; Hoffmann, Herwig; Schneider, Rolf; and Flickinger, Erich, 4,288,640, Cl. 568-855.000.

BASF Wyandotte Corporation: *See*—
Camp, Ronald L., 4,288,639, Cl. 568-625.000.
Schmolka, Irving R.; and Niu, Joseph H. Y., 4,288,232, Cl. 44-51.000.

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Surzhenko, Evgeny M.; Basilaev, Bronislav F.; Molotkov, Roman V.; Madorsky, Alexandr S.; Shalun, Grigory B.; Golynkina, Valentina B.; Ershova, Margarita A.; Eliseeva, Irina P.; Trukhtenkova, Nina E.; Gurylev, Sergei M.; Kopetskaya, Diana L.; Pechko, Evgeny Y.; Khlamenko, Albert S.; and Magnitsky, Viktor V., 4,288,491, Cl. 428-332.000.

Bassignani, Luciano: *See*—
Re, Luciano; Brant, Alberto; and Bassignani, Luciano, 4,288,366, Cl. 260-245.20R.

Basu, Samarnath; and Worrell, Wayne L., to University Patents, Inc. Chalcogenide electrochemical cell. 4,288,508, Cl. 429-218.000.

Bate, Robert T.; and Morris, Henry B., to Texas Instruments Incorporated. Method of making non-volatile semiconductor memory elements having multiple dielectric layers of silicon nitride, silicon dioxide, and rutile titanium dioxide. 4,288,470, Cl. 427-88.000.

Batiuk, Walter, to Boeing Aerospace Co. Removal of protective paper tape and maskants. 4,288,269, Cl. 156-344.000.

Battelle Development Corporation: *See*—
Ensminger, Dale, 4,287,766, Cl. 73-582.000.

Battigelli, Jean A.; and Bouquet, Francois, to Saint-Gobain Industries. Glass fiberization by centrifugal feed of glass into attenuating blast. 4,288,236, Cl. 65-14.000.

Battigelli, Jean A.; Bouquet, Francois; and Fezenko, Igor, to Saint-Gobain Industries. Glass fiberization spinner. 4,288,237, Cl. 65-14.000.

Bauer, James L.: *See*—
Brown, Lawrence E.; Bauer, James L.; and Scheck, Gerald W., 4,288,282, Cl. 156-630.000.

Baugh, Charles R., to Bell Telephone Laboratories, Incorporated. Digital loop conferencing signal correction arrangement. 4,288,871, Cl. 370-86.000.

Baumann, Otto: *See*—
Wanner, Karl; Reibetanz, Wilbert; Dohse, Hans-Peter; Baumann, Otto; Spiwokz, Dietmar; Seitz, Karl; Angermair, Ernst; and Wiesner, Herbert, 4,288,187, Cl. 409-180.000.

Baus, Heinz G. Method for fastening a profiled connecting section of a partition for wet rooms to a room surface, and profiled connecting section applicable thereto. 4,287,698, Cl. 52-741.000.

Baxter Travenol Laboratories, Inc.: *See*—
Groman, Ernest V.; and Sacco, Marian E., 4,288,538, Cl. 435-7.000.
Stupar, James A., 4,287,889, Cl. 128-276.000.

Bayer Aktiengesellschaft: *See*—
Bock, Manfred; Pedain, Josef; and Slawyk, Wilhelm, 4,288,586, Cl. 528-67.000.
Ebeling, Wilfried; and Tennemann, Volkmar, 4,288,230, Cl. 23-230.00A.
Heine, Hans-Georg; Hubner, Armin; and Hartmann, Willy, 4,288,370, Cl. 260-343.600.
Illger, Hans-Walter; Dahm, Manfred; and Gonzalez-Dorner, Alberto C., 4,288,559, Cl. 521-55.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,288,446, Cl. 424-273.00P.
Mues, Volker; and Behrenz, Wolfgang, 4,288,451, Cl. 424-295.000.
Muller, Hanns P.; Rabe, Hansjurgen; and Wagner, Kuno, 4,288,566, Cl. 521-158.000.
Rolf, Meinhard; Neeff, Rutger; and Muller, Walter, 4,288,362, Cl. 260-154.000.
Rottmaier, Ludwig; Merten, Rudolf; Dhein, Rolf; and Kreuder, Hans J., 4,288,569, Cl. 525-113.000.
Wieder, Wolfgang; and Witte, Josef, 4,288,581, Cl. 526-169.200.

Bayles, Richard A. Furniture assembly. 4,287,837, Cl. 108-154.000.

BBC Brown, Boveri & Company Limited: *See*—
Fried, Reinhard; and Kudernatsch, Gunter, 4,288,203, Cl. 417-64.000.

Beach, David L.; and Kobylinski, Thaddeus P., to Gulf Research & Development Company. Process for the oligomerization of ethylene. 4,288,648, Cl. 585-523.000.

Beane, Frank T. Drain tile and pile fabric filter sleeve. 4,288,321, Cl. 210-170.000.

Beazley, Rodney T.; and Haggett, Mervyn T., to Glacier Metal Company Limited, The. Centrifugal separator. 4,288,030, Cl. 233-23.00R.

Bechstedt, Wolfgang: *See*—
Roland, Wolf-Achim; and Bechstedt, Wolfgang, 4,288,225, Cl. 8-137.000.

Beck, Frank W., to Schlegel Corporation. Weatherstrip with substrate of two different materials. 4,288,482, Cl. 428-92.000.

Beck, William M. Earring display case. 4,287,986, Cl. 206-45.190.

Becker, Jorgen, to L. & C. Steinmuller GmbH. Heat exchanger for cooling process gases which are under high pressure and temperature. 4,287,944, Cl. 165-158.000.

Becker, Karl-Heinz: *See*—
Sombroek, Johannes; Becker, Karl-Heinz; Minck, Klaus O.; and Enenkel, Hans-Joachim, 4,288,452, Cl. 424-304.000.

Becker, Werner: *See*—
Schrotz, Kurt; and Becker, Werner, 4,288,276, Cl. 156-384.000.

Beckers, Willi: *See*—
Fedders, Heinrich; and Beckers, Willi, 4,288,409, Cl. 422-219.000.

Beckman Instruments, Inc.: *See*—
Louderback, Allan L., 4,288,343, Cl. 252-408.000.

Beckstead, Jerry: *See*—
Schumann, George; and Beckstead, Jerry, 4,287,871, Cl. 126-67.000.

Bedard, Brian E.; and Geller, Gary R., to Motorola, Inc. Method of tuning apparatus by low power laser beam removal. 4,288,530, Cl. 430-315.000.

Behrenz, Wolfgang: *See*—
Mues, Volker; and Behrenz, Wolfgang, 4,288,451, Cl. 424-295.000.

Bell Telephone Laboratories, Incorporated: *See*—
Baugh, Charles R., 4,288,871, Cl. 370-86.000.
Gogal, John F., 4,288,841, Cl. 361-414.000.
Griffith, Gary L.; Johnsen, Richard G.; and Sherman, Charles J., 4,288,140, Cl. 339-74.00R.

Belloc, Andre; Florent, Jean; Lunel, Jean; Palla, Jean-Claude; and Mancy, Denise, to Rhone-Poulenc Industries. Microorganism and proteolytic enzyme derived therefrom. 4,288,556, Cl. 435-265.000.

Belony, Jean-Claude M. J. Game apparatus. 4,288,079, Cl. 273-273.000.

Bendix Corporation, The: *See*—
Kushner, Gregory A.; and Martinic, Jack, 4,287,904, Cl. 137-68.00R.
Lee, Chen Yi; Wu, Charles Tung-ming; Brooks, Mark A.; and Fallis, Robert E., 4,288,835, Cl. 361-283.000.
Seitz, William R., 4,287,865, Cl. 123-489.000.

Bennett, George H.; Osborn, Alfred W.; Bunyan, Clive N.; and Midgley, Ronald A., to Rolls-Royce Limited. Tank suitable for holding liquids. 4,287,913, Cl. 137-574.000.

Bennewitz, Matt C.: *See*—
Bennewitz, Paul F.; and Bennewitz, Matt C., 4,288,775, Cl. 338-35.000.

Bennewitz, Paul F.; and Bennewitz, Matt C. Device and method of manufacturing a relative humidity sensor and temperature sensor. 4,288,775, Cl. 338-35.000.

Benson, Samuel L., to J. I. Case Company. Two-piece grooved pin retainer. 4,288,190, Cl. 411-511.000.

Bentley-Harris Manufacturing Company: *See*—
Weil, Thomas L., 4,287,844, Cl. 112-412.000.

Berger, William R.; and Rose, Benjamin L., Jr. Domical building structure. 4,287,690, Cl. 52-81.000.

Berginski, Werner, to Leopold Kostal, Firma. Steering column jacket on the steering column of motor vehicles. 4,287,786, Cl. 74-492.000.

Bergstrom, Claes-Gustav, to Atlas Copco Aktiebolag. Device for setting the direction and/or the inclination of an elongated rock drilling apparatus. 4,288,056, Cl. 248-542.000.

Bernardi, William A. Trash bag enclosure. 4,287,637, Cl. 256-1.000.

Bernhagen, Wolfgang: *See*—
Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, 4,288,643, Cl. 585-324.000.

Berry, Doyle; and Elder, Walter S. Firehose reel and transfer device. 4,288,047, Cl. 242-86.000.

Berry, Edgar L.; and Drilling, Joseph C., to Square D Company. Fuse puller. 4,288,138, Cl. 339-45.00R.

Bertoldo, Giorgio: *See*—
Pacciarini, Antonio; and Bertoldo, Giorgio, 4,288,265, Cl. 156-126.000.

Besson, Gilbert: *See*—
Andre, Guy; and Besson, Gilbert, 4,287,657, Cl. 29-450.000.

Bethlehem Steel Corporation: *See*—
Wald, Herbert; Young, Harold K.; and Meadows, Lacy C., 4,288,476, Cl. 427-300.000.

Betts Machine Company: *See*—
Petersen, Frank H., 4,287,910, Cl. 137-493.900.

Betz Laboratories, Inc.: *See*—
Godlewski, Irene T.; Schuck, Joseph J.; and Chisarik, Andrew S., 4,288,327, Cl. 210-698.000.

Beyer, Franz; and Schucht, Peter, to Siemens Aktiengesellschaft. Strip line directional coupler. 4,288,760, Cl. 333-116.000.

Bianchi, Giuseppe: *See*—
de Nora, Vittorio; Bianchi, Giuseppe; and Nidola, Antonio, 4,288,302, Cl. 204-105.00R.

Bidwell, Charles B.: *See*—
Sielaff, Bruce H.; Praglin, Julius; McKie, James E., Jr.; Longhenry, David K.; Curtiss, Alan C.; and Bidwell, Charles B., 4,288,543, Cl. 435-34.000.

Bieber, Larry C.; and Woodell, Jack L., to Frederick Electronics Corporation. Apparatus for generating telex signaling sequences in a distributed processing telex exchange. 4,288,658, Cl. 178-3.000.

Bier, Gerhard; Kottek, Dagmar; Petersen, Egon N.; Richtzenhain, Hermann; and Vollkommer, Norbert, to Dynamit Nobel Aktiengesellschaft. Bis-carbalkoxy compounds and their preparation. 4,288,607, Cl. 560-11.000.

Bilanceri, Silvio G.; Kanner, Gary L.; and Uffer, Michael B., to Black & Decker Inc. Battery charger system and method adapted for use in a sterilized environment. 4,288,733, Cl. 320-2.000.

Billig, Ernst; Jamerson, Jackie D.; and Pruett, Roy L., to Union Carbide Corporation. Heteronuclear-bridged rhodium clusters. 4,288,380, Cl. 260-429.00R.

Bilofsky, Ruth C.; and Rogers, Howard G., to Polaroid Corporation. Image-receiving elements utilizing lamellar pigment materials. 4,288,524, Cl. 430-220.000.

Biondetti, Mario: *See*—
Schneebeli, Friedrich; and Biondetti, Mario, 4,288,703, Cl. 290-52.000.

Birjukova, Ljubov M.: *See*—
Rabinovich, Georgy L.; Maslyansky, Gdal N.; Birjukova, Ljubov M.; Levitsky, Emmanuil A.; Volkova, Kira L.; Lukina, Zoya P.; and Mozhaiko, Viktor N., 4,288,347, Cl. 252-439.000.

Birt, David E.; and Clarke, Peter J., to EMI Limited. Foil video discs. 4,288,481, Cl. 428-64.000.

Biscaro, Reno P.: *See*—
Johnson, Ralph E.; and Biscaro, Reno P., 4,288,312, Cl. 204-281.000.

Black Copy Company, Inc.: *See*—
Diamond, Arthur S.; and Floersheim, Sydney N., 4,288,519, Cl. 430-137.000.

Black & Decker Inc.: *See*—
Bilanceri, Silvio G.; Kanner, Gary L.; and Uffer, Michael B., 4,288,733, Cl. 320-2.000.

Blacker, Allen P.; and Ingle, Arthur J., to Zenith Radio Corporation. Means and method for beam spot distortion compensation in TV picture tubes. 4,288,718, Cl. 313-414.000.

Bliesener, Jens-Uwe; Geiss, Karl-Heinz; Lenke, Dieter; and Mueller, Claus D., to BASF Aktiengesellschaft. N-Arylsulfonylpyrroles, their preparation, and therapeutic agents containing these compounds. 4,288,449, Cl. 424-274.000.

Bloch, Howard. Force applying apparatus. 4,287,653, Cl. 29-256.000.

Blodgett, Frederick M., Jr.: *See*—
Carson, Andrew B., Jr.; and Blodgett, Frederick M., Jr., 4,288,167, Cl. 400-121.000.

Blom, Hans; and Wiberg, Leif. District-heating line and a method of manufacturing the same. 4,288,653, Cl. 174-47.000.

Blom, Hans; and Wiberg, Leif. District-heating line. 4,288,654, Cl. 174-47.000.

Blore, Peter D.; and Wheatley, David S., to Metal Closures Venue Packaging Limited. Apparatus for producing bags of plastics material. 4,288,279, Cl. 156-498.000.

Bobear, William J., to General Electric Company. Flame resistant silicone rubber compositions and methods. 4,288,360, Cl. 260-37.0SB.

Bock, Manfred; Pedain, Josef; and Slawyk, Wilhelm, to Bayer Aktiengesellschaft. Process for the preparation of polyisocyanates containing isocyanurate groups. 4,288,586, Cl. 528-67.000.

Bodenbenner, Kurt; Muller, Gerhard; and Perkow, Helmut, to Hoechst Aktiengesellschaft. Process and device for the introduction of explosive gases into a combustion chamber. 4,288,211, Cl. 431-346.000.

Bodenseewerk Geratetechnik GmbH: *See*—
Gauggel, Roland, 4,288,050, Cl. 244-3.160.

Boeck, LaVerne D.; and Kastner, Ralph E., to Eli Lilly and Company. Method of producing the A-30912 antibiotics. 4,288,549, Cl. 435-119.000.

Boehringer Ingelheim GmbH: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Seeger, Ernst; and Kahling, Joachim, 4,288,437, Cl. 424-246.000.

Boehringer Mannheim GmbH: *See*—
Friebe, Walter-Gunar; Michel, Helmut; Ross, Carl H.; Wiedemann, Fritz; Sponer, Gisbert; and Schaumann, Wolfgang, 4,288,442, Cl. 424-267.000.

Boeing Aerospace Co.: *See*—
Batiuk, Walter, 4,288,269, Cl. 156-344.000.

Boeing Company, The: *See*—
Baetke, Russell E., 4,287,788, Cl. 74-501.50R.
Bormke, Odo S.; and Bunch, Ronald L., 4,288,313, Cl. 204-297.00W.
Brasfield, Robert G., 4,288,830, Cl. 361-56.000.
Klees, Garry, 4,287,715, Cl. 60-204.000.

Boelens, Harmannus; and Ter Heide, Roelof, to Naarden International N.V. Perfume compositions containing 3,3-dimethylbicyclo-[2,2,1]-heptane-2-carboxylic acid as a perfume. 4,288,349, Cl. 252-522.00R.

Boero, Angioletta: *See*—
Palazzetti, Mario; Boero, Angioletta; Demichelis, Francesca; and Minetti-Mezzetti, Enrica, 4,287,881, Cl. 126-440.000.

Boge GmbH: *See*—
Brenner, Heinz; and Hamaekers, Arno, 4,288,063, Cl. 267-8.00R.

Bogorsky, Mikhail V.: *See*—
Kuchuk-Yatsenko, Sergei I.; Chernenko, Ivan A.; Bogorsky, Mikhail V.; Kulesh, Alexandr I.; Cherednichok, Vitaly T.; and Tishura, Vladimir I., 4,288,676, Cl. 219-100.000.

Bohnengel, Andrew C., to Perfect Measuring Tape Company, The. Measuring tape dispenser. 4,288,043, Cl. 242-55.000.

Bordini, Fosco; and Mauri, Luigi, to Moplefan S.p.A. Readily thermoweldable films of polyolefins coated with lacquers based on ketonic resins. 4,288,477, Cl. 428-35.000.

Borg-Warner Corporation: *See*—
Tuzson, John J., 4,287,975, Cl. 192-82.00T.

Bormke, Odo S.; and Bunch, Ronald L., to Boeing Company, The. Hanger for handling sheet material during processing thereof. 4,288,313, Cl. 204-297.00W.

Bosard, James H. Wind driven generator with blade protecting means. 4,288,704, Cl. 290-55.000.

Boston Machine Works Company: *See*—
Morin, Robert W., 4,288,280, Cl. 156-510.000.

Boucherie, Evert C.: *See*—
van der Vlis, Adrianus; and Boucherie, Evert C., 4,288,699, Cl. 250-507.000.

Bouillon, Claude: *See*—
Koulbanis, Constantin; Bouillon, Claude; and Darmenton, Patrick, 4,288,433, Cl. 424-232.000.

Boullanger, Michelle: *See*—
Vincent, Michel; Duhault, Jacques; Boullanger, Michelle; and Remond, Georges, 4,288,453, Cl. 424-317.000.

Bouquet, Francois: *See*—
Battigelli, Jean A.; and Bouquet, Francois, 4,288,236, Cl. 65-14.000.
Battigelli, Jean A.; Bouquet, Francois; and Fezenko, Igor, 4,288,237, Cl. 65-14.000.

Bovenkerk, Harold P.; and Gigl, Paul D., to General Electric Company. Temperature resistant abrasive compact and method for making same. 4,288,248, Cl. 75-226.000.

Bowser, Donald M., to Truswal Systems Corporation. Truss assembly machine. 4,287,822, Cl. 100-35.000.

Boyce, Jay E.: *See*—
Miska, Stanley R.; and Boyce, Jay E., 4,288,483, Cl. 428-92.000.

Boyle, Patrick T., to Maryland Cup Corporation. Means for imprinting multiple permutations and combinations of cards on cups. 4,287,824, Cl. 101-45.000.

BP Nutrition (UK) Limited: *See*—
Barnes, Edward, 4,288,458, Cl. 426-7.000.

Brabec, Michael W. Method and apparatus for screen printing. 4,287,826, Cl. 101-115.000.

Brack, Karl, to Design Cote Corp. Radiation curable release coatings. 4,288,479, Cl. 428-40.000.

Brackmann, Warren A.; and Kuhner, Albert, to Rothmans of Pall Mall Canada Limited. Treatment and opening of oriental tobacco bales. 4,287,897, Cl. 131-303.000.

Braconier, Karl, to International Packings Corporation. Hydrodynamic shaft seal. 4,288,083, Cl. 277-134.000.

Bradshaw, John: *See*—
Judd, Duncan B.; Clitherow, John W.; Price, Barry J.; and Bradshaw, John, 4,288,443, Cl. 424-267.000.

Braithwaite, David, to Emhart Industries, Inc. Plunger mounting mechanism in a glassware forming machine. 4,288,240, Cl. 65-246.000.

Brana, Miguel F.; Lopez Rodriguez, Maria L.; Castellano Berlanga, Jose M.; Soto Camara, Jose L.; and Martinez Roldan, Cristobal, to Laboratorios Made, S.A. 1,2-Diacylamino-1,2-di(4-pyridyl)ethanes and process for producing thereof. 4,288,597, Cl. 546-265.000.

Brant, Alberto: *See*—
Re, Luciano; Brant, Alberto; and Bassignani, Luciano, 4,288,366, Cl. 260-245.20R.

Brasfield, Robert G., to Boeing Company, The. Overvoltage protector. 4,288,830, Cl. 361-56.000.

Braun, Dieter; Mehren, Herbert; and Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Vehicle adapted to be guided on tracks for the public local passenger traffic with pivotal rear axle and longitudinal guide members for such axle. 4,287,830, Cl. 104-247.000.

Braverman, Milton. Extender and header card for medicinal dispensing device and fixture base converter for filling the same. 4,288,065, Cl. 269-43.000.

Brazier, Alan J., to Vax Appliances Limited. Apparatus for cleaning floor, carpets and the like. 4,287,636, Cl. 15-321.000.

Brecher, Charles: *See*—
Kilichowski, Kurt B.; Cukor, Peter; and Brecher, Charles, 4,288,513, Cl. 430-28.000.

Breck, Louis W., Jr. Automatic belt loop tacker. 4,287,842, Cl. 112-121.270.

Breitscheidel, Hans-Ulrich: *See*—
Alfter, Franz-Werner; and Breitscheidel, Hans-Ulrich, 4,288,490, Cl. 428-315.000.

Brenner, Heinz; and Hamaekers, Arno, to Boge GmbH. Rubber elastic engine mounts or supports with hydraulic damping, especially for engine suspensions in motor vehicles. 4,288,063, Cl. 267-8.00R.

Brewer, John, to Southworth, Incorporated. Roll-away wheel truck and lift table assembly. 4,288,195, Cl. 414-608.000.

Brewer, William R.; and de Jong, Hamilton C. Multi-purpose chair for the partially disabled. 4,287,619, Cl. 4-483.000.

Bridges, James R.: *See*—
Peelman, Harold E.; and Bridges, James R., 4,288,696, Cl. 250-502.000.

Brieger, Emmet F. Formation testers. 4,287,946, Cl. 166-100.000.

Brigante, Miguel F. Free flow non-corrosive water treatment device. 4,288,323, Cl. 210-222.000.

Bright, John H., to American Cyanamid Company. Process for recovering 3-nitrobenzoic acid. 4,288,615, Cl. 562-434.000.

Bristol-Myers Company: *See*—
Oka, Masahisa; Okumura, Jun; and Naito, Takayuki, 4,288,590, Cl. 544-25.000.

British Broadcasting Corporation: *See*—
Drewery, John O.; and Storey, Richard, 4,288,810, Cl. 358-16.000.

British Steel Corporation: *See*—
Furness, Edward J.; and Wade, Philip, 4,287,744, Cl. 72-214.000.

Bromley, James E.; and Stutz, Frank, to Monsanto Company. Process for low-torque textured yarn. 4,287,713, Cl. 57-288.000.

Bronsveld, Frederik A., to Hoogovens Ijmuiden, B.V. Conveyors having a plurality of driven endless chains. 4,287,983, Cl. 198-817.000.
Brooks, Mark A.: *See*—
Lee, Chen Yi; Wu, Charles Tung-ming; Brooks, Mark A.; and Fallis, Robert E., 4,288,835, Cl. 361-283.000.
Brown, Lawrence E.; Bauer, James L.; and Scheck, Gerald W., to Hewlett-Packard Company. Method for producing a metallic pattern upon a substrate. 4,288,282, Cl. 156-630.000.
Brown, Lester: *See*—
Moskowitz, Paul M.; Rushansky, Yuliy; Brown, Lester; and Weinstein, Gerald, 4,287,817, Cl. 99-282.000.
Browne, Christopher R. Planter. 4,287,682, Cl. 47-81.000.
Brunken, Gerd; and Stangl, Rupert, to Sachs Systemtechnik GmbH. Key assembly for coded security system. 4,287,735, Cl. 70-395.000.
Brunner, Felix. Apparatus for controlling the quality of a picture which is to be processed in a reprapparatus. 4,288,157, Cl. 355-40.000.
Brunswick Corporation: *See*—
Kaugars, Eugene; and Ossola, George A., 4,288,075, Cl. 273-80.00B.
Buchser, William J.; Tate, Ralph; and Haag, Charles W., to Whirlpool Corporation. French door refrigerator seal. 4,288,135, Cl. 312-296.000.
Buckley, Bruce S., to Massachusetts Institute of Technology. Apparatus and method whereby wave energy is correlated with geometry of a manufactured part or the like or to positional relationships in a system. 4,287,769, Cl. 73-627.000.
Buckmann, Paul S., to Aerojet-General Corporation. Fan having internal polyhedral strut frame. 4,288,202, Cl. 415-142.000.
Bucsky, Gyorgy; Kiss, Zoltan; and Tatrai, Lajos, to Magyar Tudomanyos Akademia Muszaki Kemiai Kutato Intezet. Instrumental measuring method for determining the size-distribution of grained material. 4,287,757, Cl. 73-61.400.
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Rogan, John B.; and Buehler, Charles K., 4,288,580, Cl. 526-138.000.
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Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,288,622, Cl. 564-194.000.
Buhler-Miag GmbH: *See*—
Essmann, Wolfgang; and Schnellbacher, Kurt, 4,288,318, Cl. 209-139.00R.
Bunch, Ronald L.: *See*—
Bormke, Odo S.; and Bunch, Ronald L., 4,288,313, Cl. 204-297.00W.
Bunker Ramo Corporation: *See*—
Buszkiewicz, Bruno C.; and Storcel, Joseph A., 4,287,777, Cl. 74-2.000.
Bunyan, Clive N.: *See*—
Bennett, George H.; Osborn, Alfred W.; Bunyan, Clive N.; and Midgley, Ronald A., 4,287,913, Cl. 137-574.000.
Burger, Horst. Rinsing method and apparatus for car-washing installation. 4,288,255, Cl. 134-6.000.
Burlington Industries, Inc.: *See*—
Leach, Jack, 4,287,607, Cl. 2-2.500.
Burns, Arthur L.: *See*—
Pohl, Walter J.; and Burns, Arthur L., 4,287,939, Cl. 165-11.00R.
Burroughs Corporation: *See*—
Sprenkle, George J., 4,287,666, Cl. 29-753.000.
Wallace, Harry L.; and Thomas, John D., 4,288,069, Cl. 271-245.000.
Burroughs, Mark S., to Western Electric Co., Inc. Bi-modal temperature controller. 4,288,854, Cl. 364-557.000.
Burroughs Wellcome Co.: *See*—
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,288,365, Cl. 260-243.300.
Burson, Bob O., to R. E. Phelon Company, Inc. Breakerless magneto ignition. 4,288,834, Cl. 361-256.000.
Burzlauer, Gert: *See*—
Eichinger, Johann; and Burzlauer, Gert, 4,287,973, Cl. 192-54.000.
Buseth, Richard A.; and Marrison, William C., to Aeroquip Corporation. Self sealing coupling with full flow relief valve. 4,287,914, Cl. 137-613.000.
Bush Universal, Inc.: *See*—
Stanton, Leo F., 4,287,628, Cl. 12-40.500.
Buszkiewicz, Bruno C.; and Storcel, Joseph A., to Bunker Ramo Corporation. Semi-automatic contact insertion tool. 4,287,777, Cl. 74-2.000.
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Butler, Richard A., Jr.; and Crowley, Bucky, 4,288,273, Cl. 156-361.000.
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Baker, Leroy E.; and Butterfield, Barry L., 4,288,175, Cl. 405-117.000.
Buttner, Horace J. Electrical conductor alignment and retaining assembly. 4,288,670, Cl. 200-303.000.
C. Cretors and Company: *See*—
Cretors, Charles D., 4,288,686, Cl. 219-512.000.
Cahen, David: *See*—
Avigal, Yitzchak; Manassen, Joost; Hodes, Gary; and Cahen, David, 4,288,502, Cl. 429-111.000.
Cajon Company: *See*—
Gallagher, Bernard J.; Wennerstrom, Erling G.; and Houdek, Mark R., 4,288,103, Cl. 285-39.000.
Cale, Albert D., Jr., to A. H. Robins Company, Inc. Antihyperglycemic 4-substituted 2-iminoimidazolidine compositions. 4,288,447, Cl. 424-273.00R.
Cale, Albert D., Jr., to A. H. Robins Company, Inc. 4-Substituted 2-iminoimidazolidine compounds. 4,288,591, Cl. 544-139.000.
California Processing Machinery: *See*—
Meissner, Konrad E., 4,288,461, Cl. 426-231.000.
Callan, John E., to Allen-Bradley Company. Summing watt-hour transducer. 4,288,744, Cl. 324-142.000.
Camp, Ronald L., to BASF Wyandotte Corporation. Alpha-olefin oxide-modified liquid polyether thickeners. 4,288.639, Cl. 568-625.000.
Campbell, Charles D., to Signet Optical Corporation. Resin ophthalmic lenses having a prismatic segment. 4,288,149, Cl. 351-170.000.
Campbell, George L., to Syracuse Tank & Manufacturing. Method for producing a helically wound pipe having a predetermined diameter. 4,287,739, Cl. 72-34.000.
Campbell, Glenn M., Jr.; and Newkirk, Raymond K., to Newkirk, Raymond K. Temperature control apparatus. 4,288,271, Cl. 156-359.000.
Canadian Patents & Dev. Limited: *See*—
Seguin, Herb J. J.; Tulip, John; and Nam, Kyong H., 4,288,758, Cl. 331-94.5PE.
Canon Kabushiki Kaisha: *See*—
Ikawa, Kazuo, 4,288,722, Cl. 315-151.000.
Kutsuwada, Noboru; Saito, Minoru; Namiki, Ryoichi; and Kusunoki, Katsuo, 4,288,514, Cl. 430-54.000.
Matsumoto, Seiichi; Yokota, Hideo; and Matsuda, Mutsuhide, 4,288,151, Cl. 354-25.000.
Sado, Ichiro; Kishimoto, Juji; and Murata, Hiroshi, 4,288,792, Cl. 340-756.000.
Sakurada, Nobuaki; Shinoda, Nobuhiko; Mashimo, Yukio; Ito, Tadashi; and Ito, Fumio, 4,288,154, Cl. 354-23.00D.
Uzawa, Shunichi; Matsumoto, Shigeyuki; Miyazaki, Minoru; Iijima, Akio; and Watanabe, Kunio, 4,288,799, Cl. 346-140.00R.
Carael, Frans; Claeys, Daniel A.; and Janssens, Wilhelmus, to Agfa-Gevaert N.V. Non-photosensitive receptor material suited for producing black-and-white silver images and dye images and a process for the production of such images therewith. 4,288,522, Cl. 430-213.000.
Caravito, Vito A.; and Rye, Grover W., to Goodyear Tire & Rubber Company, The. Multiple ring tire. 4,287,927, Cl. 152-302.000.
Cardin, Hubert H.: *See*—
Goins, James R.; and Cardin, Hubert H., 4,287,873, Cl. 126-194.000.
Cardini, Giuliano: *See*—
Zotti, Aldo; and Cardini, Giuliano, 4,288,554, Cl. 435-247.000.
Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See*—
Eichinger, Johann; and Burzlauer, Gert, 4,287,973, Cl. 192-54.000.
Erhardt, Manfred; Fendt, Werner; and Huber, Manfred, 4,287,659, Cl. 29-568.000.
Carlo, Dennis J.: *See*—
Karkhanis, Yashwant D.; and Carlo, Dennis J., 4,288,557, Cl. 435-272.000.
Carlson, Roland W.: *See*—
Walters, Ronald G.; and Carlson, Roland W., 4,288,695, Cl. 250-445.00T.
Carr, Peter; and Chi, Chen H., to Energy Development Associates, Inc. Control of edge effects of oxidant electrode. 4,288,507, Cl. 429-209.000.
Cars & Concepts, Inc.: *See*—
Chrysler, Richard R., 4,287,654, Cl. 29-401.100.
Carson, Andrew B., Jr.; and Blodgett, Frederick M., Jr., to General Electric Company. Printhead and blades therefor. 4,288,167, Cl. 400-121.000.
Carstab Corporation: *See*—
Zestermann, Mary J.; and Hussar, John F., 4,288,361, Cl. 260-45.8NZ.
Carter, Bryan G., to Alcan Research and Development Limited. Enhanced hydrothermal sealing of anodized aluminum. 4,288,299, Cl. 204-35.00N.
Carter, George W., to RCA Corporation. Controlled local oscillator with apparatus for extending its frequency range. 4,288,875, Cl. 455-197.000.
Cartridge Actuated Devices, Inc.: *See*—
Soo-Hoo, Edward, 4,288,005, Cl. 222-5.000.
Cassels, Ian G., to Ferranti Limited. Lasers angular rate sensor. 4,288,163, Cl. 356-350.000.
Castellano Berlanga, Jose M.: *See*—
Brana, Miguel F.; Lopez Rodriguez, Maria L.; Castellano Berlanga, Jose M.; Soto Camara, Jose L.; and Martinez Roldan, Cristobal, 4,288,597, Cl. 546-265.000.
Castner, Raymond P.: *See*—
Gerkey, Kenneth S.; and Castner, Raymond P., 4,287,655, Cl. 29-407.000.
Caterpillar Tractor Co.: *See*—
Grim, George B., 4,288,215, Cl. 432-103.000.
Livesay, Richard E.; and Wright, Paul L., 4,288,172, Cl. 403-317.000.
Wells, Alan W., 4,288,128, Cl. 308-36.200.
Cedendahl, Bengt E., to Saab-Scania Aktiebolag. Apparatus for facilitating gear changing in mechanical gearboxes. 4,287,784, Cl. 74-473.00R.
Cellu-Craft Products Company: *See*—
Jacques, Pierre, 4,287,876, Cl. 126-426.000.

Centola, Paolo: *See—*
Codignola, Franco; Vergini, Giorgio; Gronchi, Paolo; and Centola, Paolo, 4,288,641, Cl. 568-855.000.

Centro Ricerche Fiat S.p.A.: *See—*
Palazzetti, Mario; Boero, Angioletta; Demichelis, Francesca; and Minetti-Mezzetti, Enrica, 4,287,881, Cl. 126-440.000.

Century Brass Products, Inc.: *See—*
Wisyanski, Thomas W., 4,288,033, Cl. 236-93.00A.

Cerberus AG: *See—*
Schnell, Walter, 4,288,790, Cl. 340-628.000.

Cessou, Maurice, to Institut Francais du Petrole. Method and apparatus for recovering products of low pumpability. 4,287,903, Cl. 137-13.000.

Chambers, Bruce J. Method and means for threading dowels. 4,287,627, Cl. 10-88.000.

Champion International Corporation: *See—*
Peterson, David S., 4,288,027, Cl. 229-43.000.

Chang, Sir-Sea; Chern, Sheng-Laang; Ting, Gann; and Kuo, Tsai-Shu, to Institute of Nuclear Energy Research. Post treatment method for the recovery of uranium from wet-process phosphoric acid. 4,288,412, Cl. 423-10.000.

Charpentier, Michel: *See—*
Chauvat, Dominique; and Charpentier, Michel, 4,288,783, Cl. 340-149.00A.

Chatterjea, Probir K.; and Shore, Daniel B., to International Harvester Company. Two-stage concentric hydraulic brake booster. 4,287,813, Cl. 91-434.000.

Chatterji, Debajyoti; and Park, Dong-Sil, to Electric Power Research Institute, Inc. Sulfur electrode container and methods of manufacture. 4,287,664, Cl. 29-623.200.

Chauvat, Dominique; and Charpentier, Michel, to Chauvat, Dominique; Charpentier, Michel; and S.A. Emile Chauvat et Sofranq Reunis, a part interest to each. Device for selectively authorizing passage through a door. 4,288,783, Cl. 340-149.00A.

Chemetron Corporation: *See—*
Students, Peter A., 4,287,719, Cl. 62-10.000.

Chemische Werke Huls AG: *See—*
Springmann, Hermann, 4,288,389, Cl. 260-504.00S.

Cherednichok, Vitaly T.: *See—*
Kuchuk-Yatsenko, Sergei I.; Chernenko, Ivan A.; Bogorsky, Mikhail V.; Kulesh, Alexandr I.; Cherednichok, Vitaly T.; and Tishura, Vladimir I., 4,288,676, Cl. 219-100.000.

Chern, Sheng-Laang: *See—*
Chang, Sir-Sea; Chern, Sheng-Laang; Ting, Gann; and Kuo, Tsai-Shu, 4,288,412, Cl. 423-10.000.

Chernenko, Ivan A.: *See—*
Kuchuk-Yatsenko, Sergei I.; Chernenko, Ivan A.; Bogorsky, Mikhail V.; Kulesh, Alexandr I.; Cherednichok, Vitaly T.; and Tishura, Vladimir I., 4,288,676, Cl. 219-100.000.

Chevron Research Company: *See—*
Lewis, Robert A.; and Honnen, Lewis R., 4,288,612, Cl. 560-159.000.
Stanton, Garth M., 4,288,336, Cl. 252-33.000.

Chi, Chen H.: *See—*
Carr, Peter; and Chi, Chen H., 4,288,507, Cl. 429-209.000.

Chianelli, Russell R.; and Pecoraro, Theresa A., to Exxon Research & Engineering Co. Method of preparing chalcogenides of group VIII by low temperature precipitation from monaqueous solution, the products produced by said method and their use as catalysts. 4,288,422, Cl. 423-509.000.

Chiba, Seiichi: *See—*
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; Shimogawa, Toshiaki; and Chiba, Seiichi, 4,288,098, Cl. 280-806.000.

Chibayaku Groceries, Incorporated: *See—*
Kubo, Shinji; and Yamada, Norio, 4,287,760, Cl. 73-149.000.

Ching, Ta-Yen, to General Electric Company. UV Stabilizers, coating compositions and composite structures obtained therefrom. 4,288,631, Cl. 568-333.000.

Chisarik, Andrew S.: *See—*
Godlewski, Irene T.; Schuck, Joseph J.; and Chisarik, Andrew S., 4,288,327, Cl. 210-698.000.

Chou, Chih H.: *See—*
Church, George A.; and Chou, Chih H., 4,288,602, Cl. 548-361.000.

Christini, James N.; Kim, Tai K.; and McClintic, Robert P., to GTE Products Corporation. Calciner with tapered reverse feed spiral. 4,288,216, Cl. 432-112.000.

Christini, James N.; Kim, Tai K.; and McClintic, Robert P., to GTE Products Corporation. Rotary calciner feed spiral. 4,288,217, Cl. 432-112.000.

Chrysler, Richard R., to Cars & Concepts, Inc. Method of modifying the roof of a vehicle to receive removable roof panels. 4,287,654, Cl. 29-401.100.

Chu, Chin-Chiun, to Mobil Oil Corporation. Shape selective reactions with alkaline earth-modified zeolite catalysts. 4,288,647, Cl. 585-467.000.

Chupp, John P.: *See—*
Alt, Gerhard H.; and Chupp, John P., 4,288,242, Cl. 71-76.000.

Church, George A.; and Chou, Chih H., to American Home Products Corporation. Selective oxidation of 1,2-diphenyl-4-(2-phenylthio)ethyl)-3,5-pyrazolidinedione to the sulfinyl compound. 4,288,602, Cl. 548-361.000.

Ciba-Geigy AG: *See—*
Long, William E., 4,288,598, Cl. 546-288.000.
Rosner, Manfred, 4,288,620, Cl. 564-144.000.

Ciba-Geigy Corporation: *See—*
Abel, Heinz, 4,288,226, Cl. 8-496.000.
Haas, Georges; Rossi, Alberto; Jaeggi, Knut A.; and Sele, Alex, 4,288,450, Cl. 424-283.000.
Hurter, Rudolf, 4,288,363, Cl. 260-155.000.
Kirchmayr, Rudolf; Fussenegger, Werner; and Illy, Hugo, 4,288,560, Cl. 521-90.000.
Loew, Peter; and Zink, Rudolf, 4,288,589, Cl. 542-466.000.
Lohse, Friedrich; Gutekunst, Ferdinand; Schmid, Rolf; and Schmitter, Andre, 4,288,565, Cl. 521-135.000.
McCracken, Philip G.; Myatt, Hal; and Petree, Harris E., 4,288,594, Cl. 544-204.000.
Nachbur, Hermann; and Rohringer, Peter, 4,288,489, Cl. 428-265.000.
Rody, Jean, 4,288,593, Cl. 544-198.000.
Schaffner, Karl; Wehrli, Hansuli; Muller, Beat; and Scartazzini, Riccardo, 4,288,364, Cl. 260-239.00A.
Spivack, John D., 4,288,391, Cl. 260-927.00R.
Zahir, Abdul-Cader; and Wyler, Siegfried, 4,288,583, Cl. 526-262.000.

Cilderman, Janis J.; and Kirincich, Joseph G., to Otis Elevator Company. Method for fabricating and installing thermoset sheave inserts. 4,287,651, Cl. 29-159.00R.

Ciliberto, Paul; and Kramer, Stanley, to Balchem Corporation. Noncaking, water-soluble, granular coated food ingredient. 4,288,460, Cl. 426-96.000.

Cisco, Terry C.; and Grimaila, Algert G., to Whittaker Corporation. Radiation detector for use in nuclear reactors. 4,288,291, Cl. 176-19.00R.

Claeys, Daniel A.: *See—*
Carael, Frans; Claeys, Daniel A.; and Janssens, Wilhelmus, 4,288,522, Cl. 430-213.000.

Clarion Co., Ltd.: *See—*
Mikoshiba, Nobuo; and Minagawa, Shoichi, 4,288,765, Cl. 333-195.000.

Clark, Charles R.: *See—*
McClaflin, Gifford G.; and Clark, Charles R., 4,287,902, Cl. 137-13.000.

Clark, Ralph E., to Morehouse Industries, Inc. Air chiller/drier. 4,287,724, Cl. 62-272.000.

Clarke, Peter J.: *See—*
Birt, David E.; and Clarke, Peter J., 4,288,481, Cl. 428-64.000.

Clitherow, John W.: *See—*
Judd, Duncan B.; Clitherow, John W.; Price, Barry J.; and Bradshaw, John, 4,288,443, Cl. 424-267.000.

Clover, William M., Jr., to Kirstine, Dale J. Multi-compartment container. 4,288,006, Cl. 222-42.000.

Cobaugh, Robert F.; Lynch, James E.; and Taylor, Attalee S., to AMP Incorporated. Trifurcated card edge terminal. 4,288,139, Cl. 339-74.00R.

Coburn, O. W.: *See—*
Rasmussen, Hans W., 4,288,423, Cl. 423-510.000.

Coca-Cola Company, The: *See—*
Gudnason, Geir V.; and Stell, Joseph E., 4,288,551, Cl. 435-168.000.

Codignola, Franco; Vergini, Giorgio; Gronchi, Paolo; and Centola, Paolo, to Societa Italiana Serie Acetica Sintetica S.p.A. Process for the preparation of 1,4-butynediol and related catalyst. 4,288,641, Cl. 568-855.000.

Coetzer, Johan; and Thackeray, Michael M., to South African Inventions Development Corp. Cathode for an electrochemical cell and an electrochemical cell. 4,288,506, Cl. 429-199.000.

Cohen, Samuel, to Ecopol. Electrolytic device. 4,288,309, Cl. 204-225.000.

Coin Acceptors, Inc.: *See—*
Krejci, Wayne, 4,287,974, Cl. 192-56.00R.

Colby, Edward B., Jr.: *See—*
McIntosh, Kenneth W.; and Colby, Edward B., Jr., 4,287,930, Cl. 152-357.00R.

Cole, Donald G.: *See—*
Rahm, Joseph A.; and Cole, Donald G., 4,288,415, Cl. 423-82.000.
Rahm, Joseph A.; and Cole, Donald G., 4,288,417, Cl. 423-83.000.

Collagen Corporation: *See—*
Scribner, Herbert C., Jr., 4,288,498, Cl. 428-473.000.

Collette, Roderick E., to Pawling Rubber Corporation. Interlocking rubber mat. 4,287,693, Cl. 52-177.000.

Colvin, Floyd W.: *See—*
Singh, Prithipal; Khanna, Pyare L.; and Colvin, Floyd W., 4,288,553, Cl. 435-188.000.

Cominco Ltd.: *See—*
Johnson, Ralph E.; and Biscaro, Reno P., 4,288,312, Cl. 204-281.000.

Compression Labs, Inc.: *See—*
Bader, Ronald S.; Rennick, Lyle V.; and Wallis, Robert H., 4,288,782, Cl. 340-146.30Q.

Comstock, Lowell R.; and Smith, Percy L., to Union Carbide Corporation. Polyester compositions. 4,288,571, Cl. 525-170.000.

Cone, Richard E., to Questor Corporation. High chair tray attachment mechanism. 4,288,123, Cl. 297-154.000.

Conoco, Inc.: *See—*
Mazza, Raymond L., 4,287,953, Cl. 166-301.000.
McClaflin, Gifford G.; and Clark, Charles R., 4,287,902, Cl. 137-13.000.

Conover, Steven M.; Loring, Robert M.; Ludwico, William A.; Arnold, John W.; and Ferber, George, to Mobay Chemical Corporation; and General Motors Corporation. Process for the production of microcellular elastomeric moldings and the resultant products. 4,288,564, Cl. 521-122.000.

Container Corporation of America: *See*—
House, Richard F., 4,287,988, Cl. 206-365.000.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Huinink, Heinrich, 4,287,929, Cl. 152-354.00R.
Cookson, Alan H.: *See*—
Kemeny, George A.; and Cookson, Alan H., 4,288,652, Cl. 174-21.00C.
Cooper, George W., to Fruehauf Corporation. Device for sensing the tension in a load carrying line. 4,287,759, Cl. 73-862.450.
Cooper, Hill M., Jr.; Cooper, William B.; and Cooper, Robert M. Sawmill work feeding and product handling apparatus. 4,287,798, Cl. 83-155.000.
Cooper, Robert M.: *See*—
Cooper, Hill M., Jr.; Cooper, William B.; and Cooper, Robert M., 4,287,798, Cl. 83-155.000.
Cooper, William B.: *See*—
Cooper, Hill M., Jr.; Cooper, William B.; and Cooper, Robert M., 4,287,798, Cl. 83-155.000.
Copenhafer, William C.; and Rauh, Francis, to Intermountain Research & Develop. Corp. Enhanced recovery of sodium carbonate from NaCl-containing sodium carbonate solutions. 4,288,419, Cl. 423-190.000.
Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Thermoplastic compositions of epichlorohydrin rubber and poly(alkyl methacrylate) resin. 4,288,570, Cl. 525-133.000.
Corbett, Robert L., Jr. Cooling apparatus for diffusers. 4,287,940, Cl. 165-48.00R.
Corbic, Yves J., to Gatrun Anstalt. Method and installation for packaging in a sterile medium. 4,287,702, Cl. 53-425.000.
Cornell, G. Howard. Corner joint formation for building log. 4,287,694, Cl. 52-233.000.
Cornell, William H.: *See*—
Siedenstrang, Roy W.; and Cornell, William H., 4,288,399, Cl. 264-25.000.
Councell, Graham D. Microwave actuated steam generator. 4,288,674, Cl. 219-10.55A.
Cox, Robert P.; and Tarradellas, Norbert R., to Lummus Company, The. Recovery of aromatics from styrene production off-gas. 4,288,234, Cl. 55-48.000.
Coxsey, Darrell W. Safety apparatus. 4,287,963, Cl. 182-231.000.
Coyle, Forrest E.: *See*—
Patel, Jayant M.; Wolfe, Jerome K.; Coyle, Forrest E.; and Farley, James R., 4,288,667, Cl. 200-48.00R.
Cozzens, John J.: *See*—
Wilterding, Jack E.; and Cozzens, John J., 4,288,857, Cl. 364-728.000.
Craft, Donald I.; and Kramer, Morton, to General Electric Company. Foamable polyester composition. 4,288,561, Cl. 521-90.000.
Cramer, Jurgen: *See*—
Mitzlaff, Michael; Cramer, Jurgen; and Pistorius, Rudolf, 4,288,300, Cl. 204-59.00R.
Cretors, Charles D., to C. Cretors and Company. Thermostat for popcorn cooking containers or the like. 4,288,686, Cl. 219-512.000.
Crites, Roger C., to McDonnell Douglas Corp. Vibrating electret reed voltage generator. 4,288,735, Cl. 322-2.00A.
Cromer, Charles F.: *See*—
Fischer, William H.; Cromer, Charles F.; and Rostron, Joseph R., 4,288,668, Cl. 200-150.00G.
Crosby, John; Holland, David; Laidler, Dale A.; and Milner, David J., to Imperial Chemical Industries Limited. Process for the preparation of cyclopropane carboxylic acid esters. 4,288,387, Cl. 260-465.00D.
Crossley, Roger, to John Wyeth & Brother Limited. Anti-ulcer treatment method. 4,288,439, Cl. 424-263.000.
Crowley, Bucky: *See*—
Butler, Richard A., Jr.; and Crowley, Bucky, 4,288,273, Cl. 156-361.000.
Crystal Systems Inc.: *See*—
Schmid, Frederick, 4,287,869, Cl. 125-16.00R.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Di Vita, Pietro, 4,288,143, Cl. 350-96.210.
Tamburelli, Giovanni, 4,288,872, Cl. 375-14.000.
Csiba, Jan: *See*—
Stensson, Bo G.; Harstrom, Jan O.; and Csiba, Jan, 4,287,968, Cl. 188-74.000.
Cucinella, Salvatore: *See*—
Dozzi, Giovanni; and Cucinella, Salvatore, 4,288,381, Cl. 260-448.0AD.
Cukor, Peter: *See*—
Kilichowski, Kurt B.; Cukor, Peter; and Brecher, Charles, 4,288,513, Cl. 430-28.000.
Cummins Engine Company, Inc.: *See*—
Oldfield, Thomas A.; Smith, Edward D.; and Furukawa, Hideo, 4,287,717, Cl. 60-606.000.
Curtin, Larry E., to W. R. Grace & Co. Contactless web turning guide. 4,288,015, Cl. 226-97.000.
Curtis Instruments, Inc.: *See*—
Finger, Eugene P., 4,288,734, Cl. 320-48.000.
Curtiss, Alan C.: *See*—
Sielaff, Bruce H.; Praglin, Julius; McKie, James E., Jr.; Longhenry, David K.; Curtiss, Alan C.; and Bidwell, Charles B., 4,288,543, Cl. 435-34.000.
Curtiss, George R., to Rotor Tool Company, The. Adjustable blade wrench. 4,287,795, Cl. 81-57.260.
Dacam Corporation: *See*—
Hart, William F., 4,287,699, Cl. 53-48.000.
Dahle, Gerald, to Wilhelm Dahle Buro- und Zeichengeratefabrik. Pivoted stapler assemblies. 4,288,019, Cl. 227-144.000.
Dahlgren, Harold P. Ink metering apparatus. 4,287,828, Cl. 101-363.000.
Dahlgrun, Rolf: *See*—
Heitmann, Uwe; Lorenzen, Heinz-Christen; Wahle, Gunter; and Dahlgrun, Rolf, 4,287,754, Cl. 73-38.000.
Dahm, Manfred: *See*—
Illger, Hans-Walter; Dahm, Manfred; and Gonzalez-Dorner, Alberto C., 4,288,559, Cl. 521-55.000.
Daicel Chemical Industries Ltd.: *See*—
Akao, Hisataro, 4,288,278, Cl. 156-474.000.
Daicel Ltd.: *See*—
Takeuchi, Tadashi; and Yamabe, Taiji, 4,288,145, Cl. 350-96.340.
Daidotokushuko: *See*—
Sekiwa, Seiichiro; Kawate, Kenji; and Jinnouchi, Hidenobu, 4,288,258, Cl. 148-13.000.
Daiichi Seiyaku Co., Ltd.: *See*—
Miki, Tosaku; Eriguchi, Akashi; Abiko, Yasushi; and Kameda, Kinya, 4,288,441, Cl. 424-266.000.
Daikin Kogyo Co., Ltd.: *See*—
Ohsaka, Yohnosuke; and Tohzuka, Takashi, 4,288,376, Cl. 260-348.230.
Dailey, Alvin. Variable gear ratio transmission. 4,287,792, Cl. 74-863.000.
Daimler-Benz Aktiengesellschaft: *See*—
Braun, Dieter; Mehren, Herbert; and Wulf, Helmut, 4,287,830, Cl. 104-247.000.
Hass, Jurgen, 4,288,031, Cl. 236-34.500.
Hoffmann, Rudiger; and Feichtiger, Dieter, 4,287,915, Cl. 137-625.500.
Reidelbach, Willi; Renner, Hermann; and Klie, Wolfgang, 4,288,025, Cl. 228-173.00F.
Schuster, Hans-Dieter; Jans, Karl; and Ohlendorf, Rolf, 4,287,716, Cl. 60-276.000.
Daiwa Seiko, Inc.: *See*—
Yamamoto, Shigeru, 4,287,678, Cl. 43-24.000.
Daly, LeGrand A.: *See*—
Guth, Eugene D.; Daly, LeGrand A.; and Arand, John K., 4,288,408, Cl. 422-193.000.
Dana Corporation: *See*—
Storgard, David N., 4,287,908, Cl. 137-255.000.
Dankworth, Juergen; Hartenstein, Helmut; and Hertling, Ludwig, to Joh. A. Benckiser GmbH. Granulated composition comprising a polymer phosphate and an alkali metal aluminum silicate, process of making and method of using same. 4,288,340, Cl. 252-99.000.
Darmenton, Patrick: *See*—
Koulbanis, Constantin; Bouillon, Claude; and Darmenton, Patrick, 4,288,433, Cl. 424-232.000.
Dartmouth College: *See*—
Walsh, John E., 4,288,742, Cl. 324-61.00R.
Datafile Limited: *See*—
Barber, Donald T., 4,288,170, Cl. 402-17.000.
Pfeffer, George B., 4,288,272, Cl. 156-361.000.
Davis, Brian R.; and Rahm, Joseph A., to NL Industries, Inc. Process for manufacturing titanium compounds. 4,288,416, Cl. 423-82.000.
Davis, Brian R.; and Rahm, Joseph A., to NL Industries, Inc. Process for manufacturing titanium dioxide. 4,288,418, Cl. 423-83.000.
Davis, Jesse B. Roll leaf coating apparatus. 4,288,275, Cl. 156-367.000.
Davis, Michael A.: *See*—
Neirinckx, Rudi D.; and Davis, Michael A., 4,288,424, Cl. 424-1.000.
Davis, Robert E.: *See*—
Albert, Judith; and Davis, Robert E., 4,287,681, Cl. 46-44.000.
Dawson, Max. Portable boat dock. 4,287,625, Cl. 9-1.600.
Day, Janet A.; and Searle, Robert J. G., to Shell Oil Company. 2-Cyano-2-carboxy-3-azabicyclo[3.1.0]hexane, hydrates, esters, and salts thereof. 4,288,367, Cl. 260-326.270.
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van der Vlis, Adrianus; and Boucherie, Evert C., 4,288,699, Cl. 250-507.000.
Deatherage, Robert L., to Maytag Company, The. Appliance control housing and console construction. 4,288,133, Cl. 312-279.000.
Dechamps, Antonius J.: *See*—
Heijs, Karel A. G.; Dechamps, Antonius J.; and de Jong, Robert L., 4,288,319, Cl. 209-166.000.
Dechene, Ronald L.; and Newton, Robert E., to Auburn International, Inc. Electrical measurement of fluid void fraction for fluid having capacitive and resistive conductive components. 4,288,741, Cl. 324-61.00R.
Deck, Alphonse; and Lefaucheur, Claude, to Pneumatiques, Caoutchouc Manufacture et Plastiques. Safety tire with sidewall support members having two parts with different flexibilities. 4,287,924, Cl. 152-153.000.
Dejneka, Tamara: *See*—
Sundeen, Joseph E.; Dejneka, Tamara; and Hauck, Frederic P., 4,288,456, Cl. 424-330.000.
de Jong, Feike: *See*—
van Zon, Arie; de Jong, Feike; and Torny-Schutte, Gerridina J., 4,288,333, Cl. 252-8.55B.
de Jong, Hamilton C.: *See*—
Brewer, William R.; and de Jong, Hamilton C., 4,287,619, Cl. 4-483.000.
de Jong, Robert L.: *See*—
Heijs, Karel A. G.; Dechamps, Antonius J.; and de Jong, Robert L., 4,288,319, Cl. 209-166.000.

Del Barba, Bruno, to IRMAC S.p.A. Single-cylinder circular hosiery knitting machine with device for making ribbed knitwear fabrics. 4,287,726, Cl. 66-24.000.
Delcoigne, Adrien; and Lanneau, Jacques, to Saint Gobain Industries. Process for making plaster board. 4,288,263, Cl. 156-42.000.
DeMarthe, Jean-Michel; Gandon, Louis; and Georgeaux, Andre, to Societe Miniere et Metallurgique de Penarroya. Hydrometallurgical process for treatment of sulphur ores. 4,288,304, Cl. 204-111.000.
Demichelis, Francesca: *See*—
Palazzetti, Mario; Boero, Angioletta; Demichelis, Francesca; and Minetti-Mezzetti, Enrica, 4,287,881, Cl. 126-440.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Tanji, Hiroaki; Saito, Mitsuaki; and Ishii, Masaji, 4,288,717, Cl. 313-336.000.
Dennison Manufacturing Company: *See*—
Russell, David B., 4,288,017, Cl. 227-67.000.
de Nora, Vittorio; Bianchi, Giuseppe; and Nidola, Antonio, to Diamond Shamrock Technologies S.A. Method for electrowinning metal. 4,288,302, Cl. 204-105.00R.
Denton, Arthur M., to Scovill Inc. Door closer permitting free-swing and regular-closer modes. 4,287,639, Cl. 16-48.500.
Denver Plastics, Inc.: *See*—
Wanderer, Herbert J., 4,287,996, Cl. 217-108.000.
Depey, Maurice, to Thomson-CSF. Schottky transistor logic with PNP clamp and diffused crossunder. 4,288,805, Cl. 357-44.000.
Depoorter, Henri: *See*—
Lemahieu, Raymond G.; Depoorter, Henri; and Hofman, Emiel A., 4,288,534, Cl. 430-522.000.
Deptolla, Udo: *See*—
Fabinski, Walter; and Deptolla, Udo, 4,288,693, Cl. 250-345.000.
Derderian, Edward J. Apparatus for separating adhering dried fruits and the like. 4,288,314, Cl. 209-3.000.
de Ruvo, Alfonso; Norman, Bo; Duffy, Geoffrey G.; Moller, Klaus; Hansen, Karl E.; Felsvang, Karsten S.; and Liborius, Erik, to A/S Niro Atomizer. Method and a system for separating an aqueous suspension containing fibrous particles into fractions of different average characteristics. 4,288,317, Cl. 209-139.00A.
Design Cote Corp.: *See*—
Brack, Karl, 4,288,479, Cl. 428-40.000.
Despic, Aleksandar R.: *See*—
Jovanovic, Budimir B.; Despic, Aleksandar R.; and Drazic, Dragutin M., 4,288,500, Cl. 428-650.000.
Developak Corporation: *See*—
Evers, Jack R., 4,288,014, Cl. 226-44.000.
Devine, Thomas H. Underwater air pocket work unit. 4,288,176, Cl. 405-188.000.
Devos, Francis; and Huchette, Michel, to Roquette Freres. Process for the recovery of α-hydroxy- and α-amino-carboxylic acids from sugar-containing media. 4,288,619, Cl. 562-554.000.
Dhein, Rolf: *See*—
Rottmaier, Ludwig; Merten, Rudolf; Dhein, Rolf; and Kreuder, Hans J., 4,288,569, Cl. 525-113.000.
Diamond, Arthur S.; and Floersheim, Sydney N., to Black Copy Company, Inc. Dual purpose electrophotographic magnetic toner and process of making. 4,288,519, Cl. 430-137.000.
Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof. 4,288,457, Cl. 424-353.000.
Diamond Shamrock Technologies S.A.: *See*—
de Nora, Vittorio; Bianchi, Giuseppe; and Nidola, Antonio, 4,288,302, Cl. 204-105.00R.
Diaz, Jose O. Remailable envelope. 4,288,028, Cl. 229-73.000.
Diazit Company, Inc.: *See*—
Patrick, Henry W., 4,288,155, Cl. 354-300.000.
Dickey, Jimmy R., to Offshore Power Systems. Condenser vacuum load compensating system. 4,287,718, Cl. 60-687.000.
Di Costanzo, Pasquale F.; and Spector, George. Waist band for pants. 4,287,645, Cl. 24-301.000.
Diehl GmbH & Co.: *See*—
Ruchel, Peter, 4,288,257, Cl. 148-11.50C.
Diehl, Robert E.: *See*—
Lutz, Albert W.; and Diehl, Robert E., 4,288,385, Cl. 260-465.00E.
Disko, Harry: *See*—
Allen, Robert K.; Hicks, Alan A.; and Disko, Harry, 4,287,680, Cl. 46-1.00R.
Di Vita, Pietro, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Method of and apparatus for splicing optical fibers. 4,288,143, Cl. 350-96.210.
Doak, Roni K. Coathanger suspender. 4,288,012, Cl. 294-143.000.
Dockal, Rodney O.; and Lindsey, Harold A., to AMF Incorporated. Pit cutter apparatus. 4,288,186, Cl. 409-175.000.
Dodonov, Jury I. Microwave magnetron-type device. 4,288,721, Cl. 315-39.510.
Dohse, Hans-Peter: *See*—
Wanner, Karl; Reibetanz, Wilbert; Dohse, Hans-Peter; Baumann, Otto; Spiwokz, Dietmar; Seitz, Karl; Angermair, Ernst; and Wiesner, Herbert, 4,288,187, Cl. 409-180.000.
Dolikian, Arman V., to Motorola, Inc. Shutdown circuit for a switching power supply. 4,288,831, Cl. 361-92.000.
Dominion Engineering Works Limited: *See*—
Greding, Robert, 4,288,044, Cl. 242-67.10R.
Donnelly, Bernard P. Modularized unit load and disposable pallet therefor. 4,287,991, Cl. 206-597.000.
Donohue, John A., to Standard Oil Company (Indiana). Methyl-substituted polyphenylcarboxylic acids. 4,288,588, Cl. 528-348.000.
Dosmond, Rene. Central heating and/or sanitary or industrial hot-water production installation. 4,287,723, Cl. 62-238.600.
Doulet, Clayton J. Body-attachable bag for transporting articles. 4,287,971, Cl. 190-48.000.
Dow Chemical Co., The: *See*—
Kresta, Jiri; and Shen, Chen S., 4,288,562, Cl. 521-121.000.
McDonald, Charles J., 4,288,390, Cl. 564-204.000.
Priddy, Duane B., 4,288,379, Cl. 260-410.600.
Thompson, Leonard R., 4,288,296, Cl. 203-6.000.
Dow Corning Corporation: *See*—
Huebner, David J.; and Weyenberg, Donald R., 4,288,356, Cl. 260-29.6NR.
Dozier, Alfred R. Mounting and excitation system for reaction in the plasma state. 4,287,851, Cl. 118-723.000.
Dozzi, Giovanni; and Cucinella, Salvatore, to Anic S.p.A. Method for the synthesis of alkoxyalanates of alkaline-earth metals. 4,288,381, Cl. 260-448.0AD.
Dragerwerk AG: *See*—
Eckstein, Wolfgang; and Rabenecker, Horst, 4,287,750, Cl. 73-1.00G.
Dragerwerk Aktiengesellschaft: *See*—
Hinz, Claus-Dieter; and Pasternack, Adalbert, 4,287,887, Cl. 128-202.260.
Drake, Charles A.; and Turk, Stanley D., to Phillips Petroleum Co. Dinitriles, diamines, and polyamides. 4,288,625, Cl. 564-372.000.
Drake, Charles A., to Phillips Petroleum Company. Process for hydrogenation of unsaturated dinitriles. 4,288,626, Cl. 564-491.000.
Dravo Corporation: *See*—
Karnofsky, George B.; and Slovski, John, 4,288,297, Cl. 203-81.000.
Drazic, Dragutin M.: *See*—
Jovanovic, Budimir B.; Despic, Aleksandar R.; and Drazic, Dragutin M., 4,288,500, Cl. 428-650.000.
Drewery, John O.; and Storey, Richard, to British Broadcasting Corporation. Method of and apparatus for deriving a PAL color television signal corresponding to any desired field in an 8-field PAL sequence from one stored field or picture of a PAL signal. 4,288,810, Cl. 358-16.000.
Drilling, Joseph C.: *See*—
Berry, Edgar L.; and Drilling, Joseph C., 4,288,138, Cl. 339-45.00R.
Dubois, Jean C.: *See*—
Picquendar, Jean E.; Marchal, Michel; Dubois, Jean C.; and Duda, Eugene, 4,288,528, Cl. 430-297.000.
Duda, Eugene: *See*—
Picquendar, Jean E.; Marchal, Michel; Dubois, Jean C.; and Duda, Eugene, 4,288,528, Cl. 430-297.000.
Dudleston, Alan R.; and Stemper, Harry, to Outboard Marine Corporation. Engine throttle control for marine propulsion devices and the like. 4,287,789, Cl. 74-516.000.
Duffy, Geoffrey G.: *See*—
de Ruvo, Alfonso; Norman, Bo; Duffy, Geoffrey G.; Moller, Klaus; Hansen, Karl E.; Felsvang, Karsten S.; and Liborius, Erik, 4,288,317, Cl. 209-139.00A.
Dugot, Richard, to Instrument Development Corp. Vehicle pass-by and community noise monitor. 4,287,771, Cl. 73-647.000.
Duhault, Jacques: *See*—
Vincent, Michel; Duhault, Jacques; Boullanger, Michelle; and Remond, Georges, 4,288,453, Cl. 424-317.000.
Duncan, Lloyd P. Milking device. 4,287,853, Cl. 119-14.550.
Du Pont de Nemours, E. I., and Company: *See*—
Anderson, Burton C.; and Uschold, Ronald E., 4,288,574, Cl. 525-331.000.
Fuchs, Julius J., 4,288,383, Cl. 260-453.0RW.
Graham, William F., 4,288,359, Cl. 260-32.8EP.
McShane, Herbert F., Jr., 4,288,577, Cl. 525-453.000.
Miller, Lester I.; and Smearing, Thomas J., 4,288,351, Cl. 260-21.000.
Squire, Edward N., 4,288,374, Cl. 260-347.910.
Durand, Guy, to Le Grand S.A. Coil loop type cable tie. 4,287,644, Cl. 24-16.0PB.
Durecka, John: *See*—
Rogers, Jerrold J.; and Durecka, John, 4,288,738, Cl. 323-271.000.
Durham, Robert L.: *See*—
Fletcher, Thomas A.; and Durham, Robert L., 4,288,846, Cl. 362-217.000.
Dusseldorfer Lackgrosshandlung Otto Hartung GmbH: *See*—
Hartung, Helmut, 4,288,268, Cl. 156-245.000.
Dustbane Enterprises Limited: *See*—
Hammond, Dennis A., 4,287,632, Cl. 15-150.000.
Duval, Leonard A. Method and apparatus for cleaning fine waste material mixed with oil and water. 4,288,329, Cl. 210-772.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Alfter, Franz-Werner; and Breitscheidel, Hans-Ulrich, 4,288,490, Cl. 428-315.000.
Bier, Gerhard; Kottek, Dagmar; Petersen, Egon N.; Richtzenhain, Hermann; and Vollkommer, Norbert, 4,288,607, Cl. 560-11.000.
E. P. Remy et Cie.: *See*—
Montferme, Daniel, 4,287,980, Cl. 198-425.000.
E. R. Squibb & Sons, Inc.: *See*—
Haugwitz, Rudiger D., 4,288,368, Cl. 260-326.350.
Sundeen, Joseph E.; Dejneka, Tamara; and Hauck, Frederic P., 4,288,456, Cl. 424-330.000.
Eagle Crusher Company, Inc.: *See*—
Miller, Harold J., 4,288,040, Cl. 241-263.000.
Eastman Kodak Company: *See*—
Adin, Anthony; Sutton, Richard C.; and Verdone, Joseph A., 4,288,531, Cl. 430-338.000.
Myers, Drewfus Y., Jr.; and Hawks, George H., III, 4,288,511, Cl. 430-17.000.

Poshkus, Gerald M., 4,288,533, Cl. 430-496.000.
Trotter, Jimmy R.; McConnell, Richard L.; and Joyner, Frederick B., 4,288,358, Cl. 260-31.80M.
Eaton Corporation: *See*—
Kuntner, Richard J.; and Vander Meer, James C., 4,288,828, Cl. 361-31.000.
Ebata, Hitoshi: *See*—
Manabe, Takao; Ebata, Hitoshi; and Shin, Shouichi, 4,288,851, Cl. 364-475.000.
Ebeling, Wilfried; and Tennemann, Volkmar, to Bayer Aktiengesellschaft. Method and a device for the production of a solid-forming or foam-forming flowable reaction mixture. 4,288,230, Cl. 23-230.00A.
Ebihara, Yoshimasa: *See*—
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Hatano, Masashi; Hagiwara, Tatsuo; Mikamo, Masaaki; Ebihara, Yoshimasa; Tomura, Yasutomo; and Imai, Keiji, 4,288,166, Cl. 366-149.000.
Eckel, Wolf-Dietrich; and Schulz, Eckhard, to Swiss Aluminium Ltd.; and Sigri Elektrographit GmbH. Carbon bearing contact paste. 4,288,353, Cl. 260-28.00R.
Eckert, Alton B., Jr.; Malin, Richard A.; McFiggans, Robert B.; and Pengue, Leonard M., to Pitney Bowes Inc. Printing control system. 4,287,825, Cl. 101-91.000.
Eckstein, Wolfgang; and Rabenecker, Horst, to Dragerwerk AG. Device for checking the functioning of gas measuring apparatus. 4,287,750, Cl. 73-1.00G.
Ecopol: *See*—
Cohen, Samuel, 4,288,309, Cl. 204-225.000.
Egerer, Rudolf, to Wieland-Werke Aktiengesellschaft. Apparatus for making heat-insulated structural section assemblies. 4,287,658, Cl. 29-509.000.
Egger, Eugen: *See*—
Lettner, Kurt; Egger, Eugen; and Unger, Rudolf, 4,287,861, Cl. 123-198.00E.
Egli, Werner H.; Kuhlmann, Dennis; and Wier, Jack E., to Honeywell Inc. Helmet-mounted sighting system. 4,287,809, Cl. 89-41.0EA.
Eichinger, Johann; and Burzlauer, Gert, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Shiftable friction clutch in particular for gear drives. 4,287,973, Cl. 192-54.000.
Eigenmann, Ludwig. Method of forming surface markings on roadway areas, and roadway areas produced thereby. 4,288,487, Cl. 428-213.000.
Eiloo, Gary A.: *See*—
Kaye, Robert M.; Eiloo, Gary A.; and Tucker, Thomas, 4,288,748, Cl. 324-326.000.
Ejiri, Masakazu: *See*—
Kashioka, Seiji; Shima, Yoshihiro; Miyatake, Takafumi; Ejiri, Masakazu; and Obata, Osamu, 4,288,816, Cl. 358-138.000.
Ejiri, Yoshihiro: *See*—
Nakai, Taiichiro; Furusawa, Kahei; Nunokawa, Makoto; and Ejiri, Yoshihiro, 4,288,144, Cl. 350-96.230.
Elder, Walter S.: *See*—
Berry, Doyle; and Elder, Walter S., 4,288,047, Cl. 242-86.000.
Electric Power Development Co. Ltd.: *See*—
Ito, Hayami; Nagai, Chiaki; Nakabayashi, Yasuyuki; Igarashi, Kihachiro; Mouri, Kunihiko; and Ikeda, Takashi, 4,288,420, Cl. 423-239.000.
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Hatano, Masashi; Hagiwara, Tatsuo; Mikamo, Masaaki; Ebihara, Yoshimasa; Tomura, Yasutomo; and Imai, Keiji, 4,288,166, Cl. 366-149.000.
Electric Power Research Institute, Inc.: *See*—
Chatterji, Debajyoti; and Park, Dong-Sil, 4,287,664, Cl. 29-623.200.
Fischer, William H.; Cromer, Charles F.; and Rostron, Joseph R., 4,288,668, Cl. 200-150.00G.
Wootton, Roy E., 4,288,651, Cl. 174-17.0GF.
Eli Lilly and Company: *See*—
Abdulla, Riaz F.; and Morgan, Lawrence A., 4,288,624, Cl. 564-345.000.
Boeck, LaVerne D.; and Kastner, Ralph E., 4,288,549, Cl. 435-119.000.
Eliseeva, Irina P.: *See*—
Surzhenko, Evgeny M.; Basilaev, Bronislav F.; Molotkov, Roman V.; Madorsky, Alexandr S.; Shalun, Grigory B.; Golynkina, Valentina B.; Ershova, Margarita A.; Eliseeva, Irina P.; Trukhtenkova, Nina E.; Gurylev, Sergei M.; Kopetskaya, Diana L.; Pechko, Evgeny Y.; Khlamenko, Albert S.; and Magnitsky, Viktor V., 4,288,491, Cl. 428-332.000.
Ellis, Claude E., to Sterling Drug, Inc. Corrosion resistant assembly and method of making it. 4,288,109, Cl. 285-158.000.
Ellis, Leonard C., to Virginia Chemicals Inc. Acid field test kit for refrigeration oils containing a leak detector. 4,288,402, Cl. 422-61.000.
Elmer, William B. Compound beam illuminating. 4,288,847, Cl. 362-297.000.
Elsner, Emil; and Heinen, Leo, to Korf-Stahl AG. Continuous casting method with rotary melt movement. 4,287,933, Cl. 164-452.000.
Emerit, Andre A. C. Source of vacuum and device for maintaining a negative pressure in an enclosure. 4,287,819, Cl. 99-472.000.
Emerson Electric Co.: *See*—
Freund, William R., Jr.; and Grebe, John C., Jr., 4,287,773, Cl. 73-861.120.
Grebe, John C., Jr.; and Freund, William R., Jr., 4,287,774, Cl. 73-861.170.
Emeury, Jean-Marie L.: *See*—
Pascal, Helene M.; and Emeury, Jean-Marie L., 4,288,638, Cl. 568-584.000.
Emhart Industries, Inc.: *See*—
Braithwaite, David, 4,288,240, Cl. 65-246.000.
Voyles, Gerald A., 4,288,842, Cl. 361-433.000.
EMI Limited: *See*—
Birt, David E.; and Clarke, Peter J., 4,288,481, Cl. 428-64.000.
Haque, Promod, 4,288,264, Cl. 156-67.000.
Empire of Carolina, Inc.: *See*—
Sollenberger, Edward, 4,287,964, Cl. 185-38.000.
Enenkel, Hans-Joachim: *See*—
Sombroek, Johannes; Becker, Karl-Heinz; Minck, Klaus O.; and Enenkel, Hans-Joachim, 4,288,452, Cl. 424-304.000.
Energy Detection Company: *See*—
Moffet, John N.; and Moffet, John D., 4,287,761, Cl. 73-153.000.
Energy Development Associates, Inc.: *See*—
Carr, Peter; and Chi, Chen H., 4,288,507, Cl. 429-209.000.
Hart, Thomas G., 4,288,301, Cl. 204-101.000.
Energy Equipment Company Limited, The: *See*—
Harman, Maurice, 4,288,214, Cl. 432-58.000.
Energy Research International: *See*—
Schumann, George; and Beckstead, Jerry, 4,287,871, Cl. 126-67.000.
Enga, Bernard E., to Johnson, Matthey & Co., Limited. Engines. 4,287,856, Cl. 122-4.00D.
Engel, Michael R., to Minnesota Mining and Manufacturing Company. Durable, polishable direct filling material. 4,288,221, Cl. 433-202.000.
Engel, Wolfhard; Trummlitz, Gunter; Seeger, Ernst; and Kahling, Joachim, to Boehringer Ingelheim GmbH. 2-[(Amino)-arylmethylene]-benzo[b]thiophen-3(2H)-ones. 4,288,437, Cl. 424-246.000.
Engelhardt & Forster: *See*—
Grunewald, Heinz L.; and Wellbrock, Jurgen, 4,287,730, Cl. 68-140.000.
Enokimoto, Akito; Tsuchiya, Toshio; Masuda, Tatsuo; and Takano, Suwaji, to Honda Giken Kogyo Kabushiki Kaisha. Front wheel suspension mechanism for vehicle. 4,288,096, Cl. 280-694.000.
Enright, Dorothy P.: *See*—
Lucas, James M.; Perricone, Alphonse C.; and Enright, Dorothy P., 4,288,582, Cl. 526-240.000.
Ensminger, Dale, to Battelle Development Corporation. Inspection of solder joints by acoustic impedance. 4,287,766, Cl. 73-582.000.
Enterprise Construction Services, Inc.: *See*—
Feutz, Roger A., 4,288,111, Cl. 285-183.000.
Environmental Sciences Associates, Inc.: *See*—
Matson, Wayne R., 4,288,303, Cl. 204-105.00R.
Envirotech Corporation: *See*—
Mar, Danny M., 4,288,229, Cl. 23-230.0PC.
Enzlin, Theodoor H.; and Janssen, Antonius J., to U.S. Philips Corporation. Darlington circuit having an improved diode drain. 4,288,807, Cl. 357-46.000.
Epper, Wolfgang; and Heckmann, Wolfgang, to Klockner-Humboldt-Deutz AG. Separator with pressure-responsive discharge. 4,288,029, Cl. 233-20.00A.
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Schrotz, Kurt; and Becker, Werner, 4,288,276, Cl. 156-384.000.
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Foll, Ake L.; and Widell, Stig G., 4,288,428, Cl. 424-78.000.
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Failla, Stephen J.; and Perry, Raymond S., to Plastic Components, Inc. Corner bead and installation tool. 4,288,016, Cl. 227-30.000.
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Lee, Chen Yi; Wu, Charles Tung-ming; Brooks, Mark A.; and Fallis, Robert E., 4,288,835, Cl. 361-283.000.
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Hoffmann, Rudiger; and Feichtiger, Dieter, 4,287,915, Cl. 137-625.500.
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Conover, Steven M.; Loring, Robert M.; Ludwico, William A.; Arnold, John W.; and Ferber, George, 4,288,564, Cl. 521-122.000.
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Cassels, Ian G., 4,288,163, Cl. 356-350.000.
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Hutton, Stanley P., 4,287,775, Cl. 73-861.790.
Feucht, Fritz: *See*—
Schroder, Gerhard; and Feucht, Fritz, 4,288,054, Cl. 248-225.100.
Feutz, Roger A., to Enterprise Construction Services, Inc. Joint construction for sheet metal ducts. 4,288,111, Cl. 285-183.000.
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Strub, Fritz, 4,288,330, Cl. 210-777.000.
Finger, Eugene P., to Curtis Instruments, Inc. Bidirectional integrator. 4,288,734, Cl. 320-48.000.
Finsness, Wilma L.; McMonagle, Richard I.; and Sedenquist, Edward M., to United States of America, Air Force. Aerial refueling receptacle floodlights-spoiler and fuselage, nose mounted. 4,288,845, Cl. 362-63.000.
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Baatz, Henning; Rittscher, Dieter; and Fischer, Jurgen, 4,288,698, Cl. 250-506.000.
Fischer, William H.; Cromer, Charles F.; and Rostron, Joseph R., to Electric Power Research Institute, Inc. Circuit interrupter using a minimum of dielectric liquid. 4,288,668, Cl. 200-150.00G.
Fisher, Kenneth J.; and Miller, William R., to American Sterilizer Company. Electrically focused surgical light. 4,288,844, Cl. 362-33.000.
Fisher, Leslie G.; and Waite, John S., to GKN Transmissions Limited. Universal joint outer member. 4,287,650, Cl. 29-148.40R.
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Norton, Edward J.; and Flanagan, Charles J., 4,287,675, Cl. 36-129.000.
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Keith, Donald G.; and Flecknoe-Brown, Anthony, 4,288,401, Cl. 264-550.000.
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Whitford, Darryl R., 4,288,727, Cl. 318-112.000.
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Wissner, Allan; and Floyd, Middleton B., Jr., 4,288,629, Cl. 568-330.000.
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Kindell, Jerry L.; and Flynn, Richard T., 4,288,850, Cl. 364-200.000.
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Persoons, Gustaaf M.; and Wijts, Corneel C., 4,287,707, Cl. 56-12.800.
Saller, Erik, 4,288,293, Cl. 201-6.000.
Fogarty, Thomas J. Endarterectomy method. 4,287,890, Cl. 128-303.00R.
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Grzywinski, Gerald G.; and Foley, Edward J., 4,288,480, Cl. 428-40.000.
Foley, James P., to Roanwell Corporation. Noise canceling transmitter. 4,288,663, Cl. 179-122.000.
Foll, Ake L.; and Widell, Stig G., to Ewos Aktiebolaget. Udder disinfectant and method of disinfecting teats. 4,288,428, Cl. 424-78.000.
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Ford Motor Company: *See—*
Bachrach, Benjamin I.; and Fuhrman, William J., 4,287,749, Cl. 72-467.000.
Terner, Leslie L.; Van Alsten, Roy L.; and Moskowitz, David, 4,288,495, Cl. 428-446.000.
Ford, Thomas R.: *See—*
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Formigraphic Engine Corporation: *See—*
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Forsheda Gummifabrik AB: *See—*
Nordin, Olof, 4,288,104, Cl. 285-45.000.
Forsythe, Alan K.: *See—*
Green, Charles J.; and Forsythe, Alan K., 4,287,906, Cl. 137-118.000.
Fortescue, George H., to Lockheed Corporation. Optical probe for detecting transitory and repetitive light signals. 4,288,161, Cl. 356-73.000.
Fowler, Douglas, to Fowler, Douglas. Apparatus for washing egg incubating and/or hatching trays and buggies therefor. 4,287,901, Cl. 134-56.00R.
Fraim, Freeman W.: *See—*
Gupta, Bhupendra K.; Shefsiek, Paul K.; and Fraim, Freeman W., 4,288,062, Cl. 266-88.000.
Franzen, Gustav, to Palitex Project Company GmbH. Pneumatically disengageable self-threading yarn brake mechanism in a hollow spindle assembly of a textile yarn processing machine and related method. 4,287,712, Cl. 57-279.000.
Frederick Electronics Corporation: *See—*
Bieber, Larry C.; and Woodell, Jack L., 4,288,658, Cl. 178-3.000.
Frees, Kenneth A., to Missouri Research Laboratories Inc. Industrial truck. 4,287,966, Cl. 187-9.00R.
Freund, William R., Jr.; and Grebe, John C., Jr., to Emerson Electric Co. Bidirectional magnetic flowmeter. 4,287,773, Cl. 73-861.120.
Freund, William R., Jr.: *See—*
Grebe, John C., Jr.; and Freund, William R., Jr., 4,287,774, Cl. 73-861.170.
Frey, Gunter, to Knecht Filterwerke GmbH. Diaphragm device for damping vibrations in flowing liquids. 4,287,917, Cl. 138-30.000.
Friebe, Walter-Gunar; Michel, Helmut; Ross, Carl H.; Wiedemann, Fritz; Sponer, Gisbert; and Schaumann, Wolfgang, to Boehringer Mannheim GmbH. Inhibiting adrenergic β-receptors with piperidinopropyl derivatives. 4,288,442, Cl. 424-267.000.
Fried. Krupp GmbH: *See—*
Kruger, Heinrich; and Tack, Hans, 4,288,179, Cl. 407-114.000.
Fried, Reinhard; and Kudernatsch, Gunter, to BBC Brown, Boveri & Company Limited. Multi-flow gas dynamic pressure-wave machine. 4,288,203, Cl. 417-64.000.
Friedrich Deckel Aktiengesellschaft: *See—*
Geiger, Michael; Schneider, Manfred; and Lutzkendorf, Jorg, 4,288,192, Cl. 414-223.000.
Friedrichsfeld GmbH: *See—*
Heimke, Gunther; Plester, Dietrich; and Jahnke, Klaus, 4,287,616, Cl. 3-1.900.
Fries, Carl, Jr., to International Paper Company. Apparatus for automatically dispensing non-round flexible containers. 4,288,003, Cl. 221-1.000.
Frost, May: *See—*
Frost, Robert T.; and Frost, May, 4,287,705, Cl. 54-44.000.
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Cooper, George W., 4,287,759, Cl. 73-862.450.
Frungel, Frank. Laser ceilometer with safety power-reduction feature. 4,288,158, Cl. 356-4.000.
Frymaster Corporation, The: *See—*
Moore, Lewis F.; and Price, George M., 4,287,818, Cl. 99-355.000.
Fuchs, Julius J., to Du Pont de Nemours, E. I., and Company. Propenimidates, their preparation and rearrangement to pyrimidines. 4,288,383, Cl. 260-453.0RW.
Fuhrman, William J.: *See—*
Bachrach, Benjamin I.; and Fuhrman, William J., 4,287,749, Cl. 72-467.000.
Fuhrmann, Wilhelm; and Sofranko, Andrew J., to Schloemann-Siemag, Inc. Rolling mill screwdown. 4,287,745, Cl. 72-248.000.
Fuji Mfg. Co. Ltd.: *See—*
Asai, Koichi; and Kawada, Tousuke, 4,287,668, Cl. 29-838.000.
Fuji Photo Film Co., Ltd.: *See—*
Oda, Kazutaka; and Okishi, Yoshio, 4,288,526, Cl. 430-272.000.
Seoka, Yoshio; Aoki, Kozo; Yokota, Yukio; and Kubodera, Seiiti, 4,288,532, Cl. 430-385.000.
Fuji Seal Industry Co., Ltd.: *See—*
Fujio, Masaaki, 4,287,700, Cl. 53-292.000.
Fuji Xerox Co., Ltd.: *See—*
Ozawa, Takashi; and Takenouchi, Mutsuo, 4,288,702, Cl. 250-578.000.
Fujieda, Toshio: *See—*
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Fujii, Hiroyuki: *See—*
Kobayashi, Masatoshi; Shimakawa, George; Hara, Yukio; and Fujii, Hiroyuki, 4,288,284, Cl. 156-651.000.
Fujii, Tadashiro; Yaginuma, Satoshi; Muto, Naoki; and Hayashi, Mitsuo, to Toyo Jozo Kabushiki Kaisha. Antibiotic planothiocins. 4,288,429, Cl. 424-117.000.
Fujikawa, Kanichi: *See—*
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Fujikawa, Tetsuzo; Takada, Toshiyuki; and Misawa, Kichiji, to Kawasaki Jukogyo Kabushiki Kaisha. Two-cycle engine. 4,287,860, Cl. 123-73.0PP.
Fujio, Masaaki, to Fuji Seal Industry Co., Ltd. Machine for fitting a sleeve seal of a flat form over a container. 4,287,700, Cl. 53-292.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,288,435, Cl. 424-246.000.
Takaya, Takao; and Murata, Masayoshi, 4,288,436, Cl. 424-246.000.
Fujita, Toshihito; Kikuchi, Toshiaki; and Nakazawa, Koji, to Nitto Boseki Co., Ltd. Roller apparatus for cutting glass fibers. 4,287,799, Cl. 83-347.000.
Fujitsu Limited: *See—*
Kikuchi, Hideo; Takaoka, Haruyoshi; and Baba, Shigenori, 4,288,804, Cl. 357-42.000.
Fujiwara, Minoru; Yamada, Tominori; and Tamura, Tstsuji, to Mitsui Engineering and Shipbuilding Co., Ltd. High-speed bevel gear transmission system. 4,287,790, Cl. 74-665.0GB.
Fujiwara, Mujika: *See—*
Miyashita, Takehisa; and Fujiwara, Mujika, 4,288,813, Cl. 358-75.000.
Fukuda, Hiroyuki: *See—*
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Fukukita, Hiroshi: *See—*
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Fuller, Willard A., to Hooker Chemicals & Plastics Corp. Kraft mill recycle process. 4,288,286, Cl. 162-30.00R.
Funado, Akira: *See—*
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Furness, Edward J.; and Wade, Philip, to British Steel Corporation. Taper rolling machine. 4,287,744, Cl. 72-214.000.
Furukawa, Hideo: *See—*
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Furuta, Akihiro: *See—*
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Fusco, Andrew. Light and alarm device. 4,288,784, Cl. 340-326.000.
Fussenegger, Werner: *See—*
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Futagami, Mikio: *See—*
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Futatsumori, Koji: *See—*
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G.D. Societa per Azioni: *See—*
Seragnoli, Enzo, 4,287,797, Cl. 83-74.000.
G. Siempelkamp GmbH & Co.: *See—*
Holz, Karl-Heinz, 4,288,274, Cl. 156-364.000.
Gach, Peter P.: *See—*
Luker, Charles E.; and Gach, Peter P., 4,288,000, Cl. 220-281.000.
GAF Corporation: *See—*
Ferment, George R.; and Woerner, Douglas C., 4,288,486, Cl. 428-141.000.
Gaines, Cecil A. Solar and central fireplace heating system. 4,287,877, Cl. 126-427.000.
Gakken Co., Ltd.: *See—*
Miyashita, Takehisa; and Fujiwara, Mujika, 4,288,813, Cl. 358-75.000.
Galasan, Felixberto A.: *See—*
Roldness, David J.; Galasan, Felixberto A.; and Watson, Thomas H., 4,287,833, Cl. 105-378.000.
Gallagher, Bernard J.; Wennerstrom, Erling G.; and Houdek, Mark R., to Cajon Company. Fluid fitting having gripping bass means for chucking. 4,288,103, Cl. 285-39.000.
Gallagher, John J. Stratified fluid interface recorder. 4,287,756, Cl. 73-61.10R.
Gana, John; and Torlay, Dwight L., to United States Steel Corporation. Refractory insulated member and method of installation thereof in a reheat furnace. 4,288,219, Cl. 432-234.000.
Gandon, Louis: *See—*
DeMarthe, Jean-Michel; Gandon, Louis; and Georgeaux, Andre, 4,288,304, Cl. 204-111.000.
Gardner, Irwin J., to Exxon Research & Engineering Co. Conjugated diene butyl elastomer copolymer. 4,288,575, Cl. 525-333.000.
Garritsen, Petrus G. S.; MacVicar, Douglas J.; Young, Daniel P.; and Sojda, John G., to Inco Limited. Process for electrowinning nickel or cobalt. 4,288,305, Cl. 204-112.000.
Gartside, Robert J.; and Woebcke, Herman N., to Stone & Webster Engineering Corporation. Low residence time solid-gas separation device and system. 4,288,235, Cl. 55-196.000.
Gassman, Horst-Detlef; and Wohlwend, Ernst, to Hilti Aktiengesellschaft. Method of setting fastening elements in a hard receiving material. 4,287,656, Cl. 29-432.000.
Gatrun Anstalt: *See—*
Corbic, Yves J., 4,287,702, Cl. 53-425.000.

GATX Tank Erection Corporation: *See*—
Heisterberg, Milton W., 4,287,999, Cl. 220-222.000.

Gaudioso, Stephen L., to Xerox Corporation. Polyester resin containing magnetic toner material and process for its use in flash fuser. 4,288,516, Cl. 430-107.000.

Gauggel, Roland, to Bodenseewerk Geratetechnik GmbH. Steering device for missiles. 4,288,050, Cl. 244-3.160.

Geiger, Michael; Schneider, Manfred; and Lutzkendorf, Jorg, to Friedrich Deckel Aktiengesellschaft. Tool-changing mechanism. 4,288,192, Cl. 414-223.000.

Geiger, Robert G., to Air-Flo Co., Inc. Door locking cable. 4,288,119, Cl. 292-262.000.

Geiss, Karl-Heinz: *See*—
Bliesener, Jens-Uwe; Geiss, Karl-Heinz; Lenke, Dieter; and Mueller, Claus D., 4,288,449, Cl. 424-274.000.

Geller, Gary R.: *See*—
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General Electric Company: *See*—
Alley, Robert P.; and Tompkins, Russell E., 4,288,773, Cl. 336-160.000.
Ashby, Bruce A.; and Modic, Frank J., 4,288,345, Cl. 252-431.00R.
Bobear, William J., 4,288,360, Cl. 260-37.0SB.
Bovenkerk, Harold P.; and Gigl, Paul D., 4,288,248, Cl. 75-226.000.
Carson, Andrew B., Jr.; and Blodgett, Frederick M., Jr., 4,288,167, Cl. 400-121.000.
Ching, Ta-Yen, 4,288,631, Cl. 568-333.000.
Craft, Donald I.; and Kramer, Morton, 4,288,561, Cl. 521-90.000.
Fletcher, Thomas A.; and Durham, Robert L., 4,288,846, Cl. 362-217.000.
Gillette, Stephen F., 4,288,770, Cl. 335-173.000.
Grass, Joseph J.; Barrett, David M.; and Wendt, Randolph N., 4,288,700, Cl. 250-523.000.
Howell, Edward K., 4,288,769, Cl. 335-173.000.
Howell, Edward K., 4,288,833, Cl. 361-124.000.
MacBeth, Ian H., 4,288,772, Cl. 336-58.000.
Merola, Pasquale A.; and Quick, Marshall K., 4,288,858, Cl. 364-826.000.
Niemann, Roy A., 4,288,681, Cl. 219-125.110.
Olashaw, William F., 4,288,656, Cl. 174-71.00B.
Otto, Charles W., 4,287,662, Cl. 29-596.000.
Pohl, Walter J.; and Burns, Arthur L., 4,287,939, Cl. 165-11.00R.
Poling, Ronald W., 4,287,780, Cl. 74-100.00P.
Stark, Charles J., Jr., 4,288,603, Cl. 556-422.000.
Thompson, Paige W., 4,287,746, Cl. 72-338.000.
Will, Fritz G., 4,288,683, Cl. 219-290.000.
Wilson, James W. A.; and Steigerwald, Robert L., 4,288,732, Cl. 318-723.000.

General Microwave Corporation: *See*—
Hopfer, Samuel, 4,288,761, Cl. 333-116.000.
Hopfer, Samuel, 4,288,763, Cl. 333-164.000.

General Motors Corporation: *See*—
Conover, Steven M.; Loring, Robert M.; Ludwico, William A.; Arnold, John W.; and Ferber, George, 4,288,564, Cl. 521-122.000.
Graham, Donald E., 4,288,730, Cl. 318-599.000.
Holland, Steven W., 4,288,852, Cl. 364-508.000.
Milbrandt, Carlton A.; and Schoen, Roy C., 4,288,666, Cl. 200-47.000.
Rogers, Wesley A.; and Laggan, James J., 4,288,788, Cl. 340-378.200.
Staub, Vincent M., Jr., 4,287,978, Cl. 192-113.00B.
Vazquez-Cuervo, Alfonso; Richards, Frederick T.; Bafunno, Daniel V.; and Papacostas, George, 4,288,726, Cl. 318-54.000.

General Products Company, Inc.: *See*—
McKann, H. Smith, 4,287,684, Cl. 49-468.000.

General Trailer Company, Inc.: *See*—
Schmidt, Kenneth J., 4,287,958, Cl. 177-136.000.

Generale de Fluide: *See*—
Murtin, Fernand R. C., 4,288,749, Cl. 324-464.000.

George Koch Sons, Inc.: *See*—
Koch, Robert L., II, 4,287,671, Cl. 34-23.000.

Georgeaux, Andre: *See*—
DeMarthe, Jean-Michel; Gandon, Louis; and Georgeaux, Andre, 4,288,304, Cl. 204-111.000.

Georgii, Hans C., to AB Hydro Betong. Process in the manufacture of space frameworks, and a machine for the manufacture thereof. 4,287,919, Cl. 140-112.000.

Geppert, John M. Solar collector. 4,287,880, Cl. 126-439.000.

Gerkey, Kenneth S.; and Castner, Raymond P., to Westinghouse Electric Corp. End effector position and identification system for steam generator servicing machine. 4,287,655, Cl. 29-407.000.

Gerry, Martin E. Inductive-capacitive cyclic charge-discharge ignition system. 4,288,723, Cl. 315-209.00R.

Gertisser, Berthold; and Henzi, Beat, to Sandoz Ltd. Basic phenoxazine dyestuffs. 4,288,227, Cl. 8-655.000.

Gestrelius, Stina M., to Novo Industri A/S. Immobilized intracellular enzymes. 4,288,552, Cl. 435-174.000.

Gewirtz, William. Illusion creating device. 4,288,072, Cl. 272-8.00N.

GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H.: *See*—
Hojas, Hans; Leutgob, Alois; and Gsottbauer, Johann, 4,287,738, Cl. 72-20.000.

Gibson, Robert J. Farrowing pen. 4,287,855, Cl. 119-20.000.

Gigl, Paul D.: *See*—
Bovenkerk, Harold P.; and Gigl, Paul D., 4,288,248, Cl. 75-226.000.

Gillette Company, The: *See*—
Farmer, Robert F., III; and Sokol, Phillip E., deceased, 4,288,427, Cl. 424-70.000.

Gillette, Stephen F., to General Electric Company. Thermal override for static trip circuit breakers. 4,288,770, Cl. 335-173.000.

Gingell, Michael J., to International Standard Electric Corporation. Analogue to digital converters. 4,288,873, Cl. 375-25.000.

Giuffre, Luigi; and Spaziante, Placido M., to Vertac, Inc. Reversible adducts of isocyanates with boron compounds. 4,288,382, Cl. 260-453.00A.

GKN Transmissions Limited: *See*—
Fisher, Leslie G.; and Waite, John S., 4,287,650, Cl. 29-148.40R.

Glacier Metal Company Limited, The: *See*—
Beazley, Rodney T.; and Haggett, Mervyn T., 4,288,030, Cl. 233-23.00R.

Gladu, Yves, to NL CHEM Canada Inc. Predispersed slurry of titanium dioxide. 4,288,254, Cl. 106-300.000.

Glaxo Group Limited: *See*—
Judd, Duncan B.; Clitherow, John W.; Price, Barry J.; and Bradshaw, John, 4,288,443, Cl. 424-267.000.

Glickson, David A., to Marvin Glass & Associates. Pneumatic seesaw apparatus. 4,288,071, Cl. 272-1.00R.

GNS Gesellschaft fur Nuklear-Service mbH: *See*—
Baatz, Henning; Rittscher, Dieter; and Fischer, Jurgen, 4,288,698, Cl. 250-506.000.

Gobl, Horst, to Linde AG. Thermally insulated vessel, especially for liquefied gases. 4,288,002, Cl. 220-438.000.

Godlewski, Irene T.; Schuck, Joseph J.; and Chisarik, Andrew S., to Betz Laboratories, Inc. Copolymers for the control of the formation and deposition of materials in aqueous mediums. 4,288,327, Cl. 210-698.000.

Goebels, Hermann-Josef: *See*—
Leiber, Heinz; Jonner, Wolf-Dieter; and Goebels, Hermann-Josef, 4,288,127, Cl. 303-111.000.

Goerz Electro Gesellschaft m.b.H.: *See*—
Hollmayer, Walter, 4,288,798, Cl. 346-139.00R.

Goettert, Edward J.; and Gutman, Gustav, to Minnesota Mining and Manufacturing Company. Photothermographic stabilizers. 4,288,536, Cl. 430-619.000.

Gogal, John F., to Bell Telephone Laboratories, Incorporated. Double cavity semiconductor chip carrier. 4,288,841, Cl. 361-414.000.

Gohringer, Willi; Hachtel, Friedrich; and Muller, Wolf E. Cigarette dispenser with a lighting arrangement. 4,288,004, Cl. 221-147.000.

Goins, James R.; and Cardin, Hubert H., to White Consolidated Industries, Inc. Oven door hinge. 4,287,873, Cl. 126-194.000.

Goldberg, Bruce S., to Amerace Corporation. Laminated microporous article. 4,288,503, Cl. 429-145.000.

Goldberger, W. M.: *See*—
Markel, Richard F.; and Goldberger, W. M., 4,288,407, Cl. 422-143.000.

Golynkina, Valentina B.: *See*—
Surzhenko, Evgeny M.; Basilaev, Bronislav F.; Molotkov, Roman V.; Madorsky, Alexandr S.; Shalun, Grigory B.; Golynkina, Valentina B.; Ershova, Margarita A.; Eliseeva, Irina P.; Trukhtenkova, Nina E.; Gurylev, Sergei M.; Kopetskaya, Diana L.; Pechko, Evgeny Y.; Khlamenko, Albert S.; and Magnitsky, Viktor V., 4,288,491, Cl. 428-332.000.

Gomez, Gonzalo P.: *See*—
Gonzalez, Ramon R.; and Gomez, Gonzalo P., 4,288,223, Cl. 440-71.000.

Gomez-Olea, Mariano. Magnet-electronic lock system. 4,287,733, Cl. 70-276.000.

Goncharov, Evgeny S.; Prilutsky, Anatoly N.; and Shevchuk, Viktor I. Directional-action mechanical vibrator and a mechanical system for converting rotary motion into reciprocating motion. 4,287,779, Cl. 74-26.000.

Gonzalez-Dorner, Alberto C.: *See*—
Illger, Hans-Walter; Dahm, Manfred; and Gonzalez-Dorner, Alberto C., 4,288,559, Cl. 521-55.000.

Gonzalez, Ramon R.; and Gomez, Gonzalo P., to Astilleros Espanoles, S.A. Tubular duct for a ship propeller. 4,288,223, Cl. 440-71.000.

Goodwin, Robert J.: *See*—
Amundsen, Joseph; Goodwin, Robert J.; and Wetzel, William H., 4,288,249, Cl. 106-18.350.

Goodyear Tire & Rubber Company, The: *See*—
Caravito, Vito A.; and Rye, Grover W., 4,287,927, Cl. 152-302.000.
Feeney, George W.; and Stevenson, William G., 4,288,567, Cl. 525-99.000.
McIntosh, Kenneth W.; and Colby, Edward B., Jr., 4,287,930, Cl. 152-357.00R.

Gorbunov, Oleg P.: *See*—
Redikultsev, Jury V.; Gorbunov, Oleg P.; and Lomakin, Alexandr M., 4,288,404, Cl. 422-107.000.

Goschel, Wilhelm, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Method and apparatus for controlling a satellite. 4,288,051, Cl. 244-164.000.

Gould Inc.: *See*—
Prager, Jay M.; Sadlow, Joseph F.; and Nitzsche, John K., 4,288,839, Cl. 361-386.000.

Gozzo, Franco; Paolucci, Paride; and Longoni, Angelo, to Montedison S.p.A. N-Methyl-carbamates of 3,5-dimethyl-4-(N'-monosubstituted)-aminophenols exerting an insecticidal and acaricidal action. 4,288,611, Cl. 560-133.000.

Grad, John E.: *See*—
Grunert, Kurt A.; McKean, William J.; and Grad, John E., 4,288,669, Cl. 290-281.000.

Graham, Andrew C., to Mostek Corporation. Low-power battery backup circuit for semiconductor memory. 4,288,865, Cl. 365-229.000.

Graham, Donald E., to General Motors Corporation. Proportional and integral solenoid armature positioning control system. 4,288,730, Cl. 318-599.000.

Graham, William F., to Du Pont de Nemours, E. I., and Company. Epoxy imide compositions. 4,288,359, Cl. 260-32.8EP.

Grantham, Frederick W. Automatic moisture controller with stack sensor. 4,287,753, Cl. 73-29.000.

Grass, Joseph J.; Barrett, David M.; and Wendt, Randolph N., to General Electric Company. Cable handling device for diagnostic x-ray apparatus. 4,288,700, Cl. 250-523.000.

Gray, Gary M., to J. T. Baker Chemical Co. Method for the preparation of (E)-4-bromo-2-methylbut-2-en-1-al. 4,288,635, Cl. 568-483.000.

Gray, John C.: *See*—
Flanagan, Joseph E.; and Gray, John C., 4,288,262, Cl. 149-19.600.

Gray, Larry J.: *See*—
Widmer, Gerald L.; Gray, Larry J.; and Pardee, Richard H., 4,288,034, Cl. 239-168.000.

Grebe, John C., Jr.; and Freund, William R., Jr., to Emerson Electric Co. Magnetic flowmeter with ultrasonically cleaned electrodes. 4,287,774, Cl. 73-861.170.

Grebe, John C., Jr.: *See*—
Freund, William R., Jr.; and Grebe, John C., Jr., 4,287,773, Cl. 73-861.120.

Greding, Robert, to Dominion Engineering Works Limited. Paper reel synchronizing system. 4,288,044, Cl. 242-67.10R.

Green, Charles J.; and Forsythe, Alan K., to Sprague Devices, Inc. Control valve. 4,287,906, Cl. 137-118.000.

Green, Kieron P.: *See*—
Allen, Roger A.; Inglis, Bruce R.; and Green, Kieron P., 4,287,981, Cl. 198-457.000.

Grenell, David, to Allen-Stevens Corp. End fittings for flexible metallic conduits. 4,288,110, Cl. 285-174.000.

Griffin, Ernest E.: *See*—
Lowry, Joseph M.; and Griffin, Ernest E., 4,287,709, Cl. 56-16.900.

Griffin, William J. Cabinet-mounted bathroom-scale. 4,288,131, Cl. 312-245.000.

Griffith, Gary L.; Johnsen, Richard G.; and Sherman, Charles J., to Bell Telephone Laboratories, Incorporated. Printed wiring board interconnection apparatus. 4,288,140, Cl. 339-74.00R.

Grigorov, Sergei S.; and Nazyrov, Ravil N. Electrode for connecting to an internal organ of human body. 4,287,896, Cl. 128-786.000.

Grim, George B., to Caterpillar Tractor Co. Method and apparatus for preheating a rotatable fluidizable bed. 4,288,215, Cl. 432-103.000.

Grimaila, Algert G.: *See*—
Cisco, Terry C.; and Grimaila, Algert G., 4,288,291, Cl. 176-19.00R.

Groff, Edwin I.; and Groff, Edwin T. Method of making pretzels of selected spiral pitch. 4,288,463, Cl. 426-500.000.

Groff, Edwin T.: *See*—
Groff, Edwin I.; and Groff, Edwin T., 4,288,463, Cl. 426-500.000.

Groman, Ernest V.; and Sacco, Marian E., to Baxter Travenol Laboratories, Inc. Test method and composition therefor. 4,288,538, Cl. 435-7.000.

Gronchi, Paolo: *See*—
Codignola, Franco; Vergini, Giorgio; Gronchi, Paolo; and Centola, Paolo, 4,288,641, Cl. 568-855.000.

Gropper, George. Cleaning pad. 4,287,633, Cl. 15-209.00B.

Gross, Glenn, to Norlin Industries, Inc. Digital envelope modulator for digital waveform. 4,287,805, Cl. 84-1.260.

Grossman, Robert D. Adjustable container. 4,288,011, Cl. 224-42.420.

Grotjohann, Hermanus H.; and Reynders, John R., to U.S. Philips Corporation. Satellite communication system for speech and telegraphy. 4,288,868, Cl. 370-30.000.

Grove, William S., to PPG Industries, Inc. 2',5'-Dioxo-1'-pyrrolydinyl 5-(2-halo-4-trifluoromethylphenoxy)-2-halo-, cyano- or nitrobenzoates. 4,288,243, Cl. 71-95.000.

Grund, Christian: *See*—
Lemelson, Jerome H.; and Grund, Christian, 4,288,689, Cl. 235-435.000.

Gruner, Garrett: *See*—
Tompson, Clement R.; and Gruner, Garrett, 4,287,909, Cl. 137-312.000.

Grunert, Kurt A.; McKean, William J.; and Grad, John E., to Westinghouse Electric Corp. Electric control device. 4,288,669, Cl. 200-281.000.

Grunewald, Heinz L.; and Wellbrock, Jurgen, to Engelhardt & Forster. Bearing support for a washing machine drum. 4,287,730, Cl. 68-140.000.

Grzywinski, Gerald G.; and Foley, Edward J., to Scott Paper Company. Pressure sensitive adhesive composition and coated product. 4,288,480, Cl. 428-40.000.

Gsottbauer, Johann: *See*—
Hojas, Hans; Leutgob, Alois; and Gsottbauer, Johann, 4,287,738, Cl. 72-20.000.

GTE Laboratories Incorporated: *See*—
Kilichowski, Kurt B.; Cukor, Peter; and Brecher, Charles, 4,288,513, Cl. 430-28.000.

GTE Products Corporation: *See*—
Anderton, John J., 4,288,142, Cl. 339-176.00M.
Christini, James N.; Kim, Tai K.; and McClintic, Robert P., 4,288,216, Cl. 432-112.000.
Christini, James N.; Kim, Tai K.; and McClintic, Robert P., 4,288,217, Cl. 432-112.000.
MacInnis, Martin B.; and Kim, Tai K., 4,288,413, Cl. 423-54.000.
Marlor, Richard C., 4,288,713, Cl. 313-117.000.

Gucwa, P. R.: *See*—
Sydansk, R. D.; and Gucwa, P. R., 4,287,951, Cl. 166-281.000.

Gudnason, Geir V.; and Stell, Joseph E., to Coca-Cola Company, The. Process for the purification of sugar syrups. 4,288,551, Cl. 435-168.000.

Guenther, Bernard. Base construction for grain bins and the like including moisture sealing means. 4,287,691, Cl. 52-97.000.

Guillemin, Claude; and Mayen, Christian, to Prolabo. Sample/standard injection head for fluid-phase chromatograph. 4,288,322, Cl. 210-198.200.

Gulf Oil Corporation: *See*—
Karim, Khalid A.; and Rea, James H., 4,288,572, Cl. 525-176.000.
Karim, Khalid A.; and Rea, James H., 4,288,573, Cl. 525-177.000.

Gulf Research & Development Company: *See*—
Beach, David L.; and Kobylinski, Thaddeus P., 4,288,648, Cl. 585-523.000.

Gulf & Western Manufacturing Company: *See*—
Lankston, Robert J., 4,288,001, Cl. 220-316.000.

Gulton Industries, Inc.: *See*—
Mounteer, Carlyle A.; and Poteet, Ronald L., 4,287,772, Cl. 73-720.000.

Gump, William E. Mounting bracket. 4,288,055, Cl. 248-226.100.

Gupta, Bhupendra K.; Shefsiek, Paul K.; and Fraim, Freeman W., to Holcroft. Apparatus for control and monitoring of the carbon potential of an atmosphere in a heat-processing furnace. 4,288,062, Cl. 266-88.000.

Gurbin, Florian. Sluice gate. 4,288,059, Cl. 251-58.000.

Gurolnick, Richard C. Cartridge package. 4,288,197, Cl. 414-786.000.

Gurylev, Sergei M.: *See*—
Surzhenko, Evgeny M.; Basilaev, Bronislav F.; Molotkov, Roman V.; Madorsky, Alexandr S.; Shalun, Grigory B.; Golynkina, Valentina B.; Ershova, Margarita A.; Eliseeva, Irina P.; Trukhtenkova, Nina E.; Gurylev, Sergei M.; Kopetskaya, Diana L.; Pechko, Evgeny Y.; Khlamenko, Albert S.; and Magnitsky, Viktor V., 4,288,491, Cl. 428-332.000.

Gutekunst, Ferdinand: *See*—
Lohse, Friedrich; Gutekunst, Ferdinand; Schmid, Rolf; and Schmitter, Andre, 4,288,565, Cl. 521-135.000.

Guth, Eugene D.; Daly, LeGrand A.; and Arand, John K., to L. A. Daly Company. Apparatus for the diacritic cracking of hydrocarbon feeds for the selective production of ethylene and synthesis gas. 4,288,408, Cl. 422-193.000.

Guthart, Leo A., to Alarm Device Manufacturing Company. Area intrusion adjustable detector unit. 4,288,867, Cl. 367-93.000.

Gutman, Gustav: *See*—
Goettert, Edward J.; and Gutman, Gustav, 4,288,536, Cl. 430-619.000.

Haag, Charles W.: *See*—
Buchser, William J.; Tate, Ralph; and Haag, Charles W., 4,288,135, Cl. 312-296.000.

Haas, Georges; Rossi, Alberto; Jaeggi, Knut A.; and Sele, Alex, to Ciba-Geigy Corporation. Process for the preparation of novel benzopyrane derivatives. 4,288,450, Cl. 424-283.000.

Hach Chemical Company: *See*—
Hach, Clifford C., 4,288,308, Cl. 204-195.00R.

Hach, Clifford C., to Hach Chemical Company. Continuous pH meter. 4,288,308, Cl. 204-195.00R.

Hachtel, Friedrich: *See*—
Gohringer, Willi; Hachtel, Friedrich; and Muller, Wolf E., 4,288,004, Cl. 221-147.000.

Hack, Kurt: *See*—
Hartmannsgruber, Max; Nigg, Egon; and Hack, Kurt, 4,287,711, Cl. 57-130.000.

Hadgis, Gregory S. Key ring clip lock for pump handles. 4,287,736, Cl. 70-458.000.

Haga, Ryoichi: *See*—
Ishida, Masahiko; Haga, Ryoichi; and Odawara, Yoji, 4,288,550, Cl. 435-167.000.

Haga, Shozi; and Ootani, Hisao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic clutch release mechanism. 4,287,977, Cl. 192-91.00A.

Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, to Kureha Kagaku Kogyo Kabushiki Kaisha; and NGK Insulators, Ltd. Reinforced electrocast zirconia refractories. 4,288,251, Cl. 501-105.000.

Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; Kunz, Johann; Lemke, Werner; and Sohnle, Rudiger, to Robert Bosch GmbH. Alternator-rectifier construction where sheet metal diode support plates support a bearing. 4,288,711, Cl. 310-68.00D.

Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; and Sohnle, Rudiger, to Robert Bosch GmbH. Alternator structure for assembly with a mobile internal combustion engine, particularly for automotive use. 4,288,712, Cl. 310-91.000.

Haggard, Archie K., to Haggard I. D. Wiper, Inc. Tubular member interior wiper. 4,287,948, Cl. 166-170.000.

Haggard I. D. Wiper, Inc.: *See*—
Haggard, Archie K., 4,287,948, Cl. 166-170.000.

Haggett, Mervyn T.: *See*—
Beazley, Rodney T.; and Haggett, Mervyn T., 4,288,030, Cl. 233-23.00R.

Hagiwara, Hiroshi: *See*—
Kudo, Yoshihiko; and Hagiwara, Hiroshi, 4,288,421, Cl. 423-395.000.

Hagiwara, Tatsuo: *See*—
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Hatano, Masashi; Hagiwara, Tatsuo; Mikamo, Masaaki; Ebihara, Yoshimasa; Tomura, Yasutomo; and Imai, Keiji, 4,288,166, Cl. 366-149.000.

Haines, Robert G., to Union Carbide Corporation. Method of controlling mollusc pest. 4,288,455, Cl. 424-327.000.

Hall, Bobby E., to Halliburton Company. Methods and compositions for treating subterranean formations. 4,288,332, Cl. 252-8.55C.

Halliburton Company: *See*—
Hall, Bobby E., 4,288,332, Cl. 252-8.55C.
Peelman, Harold E.; and Bridges, James R., 4,288,696, Cl. 250-502.000.

Hallman, Robert W., to B. F. Goodrich Company, The. Puncture-sealing tire. 4,287,928, Cl. 152-346.000.

Hamaekers, Arno: *See*—
Brenner, Heinz; and Hamaekers, Arno, 4,288,063, Cl. 267-8.00R.

Hamilton, Rex. Wheelchair-carried transfer stool. 4,288,124, Cl. 297-217.000.

Hamilton, W. Duane, to American Optical Corporation. Drive mechanism. 4,288,710, Cl. 310-49.00R.

Hammond, Dennis A., to Dustbane Enterprises Limited. Retaining means for mop head. 4,287,632, Cl. 15-150.000.

Handke, Gunther: *See*—
Eusemann, Robert; Handke, Gunther; and Koller, Manfred, 4,287,970, Cl. 188-269.000.

Hansen, Arne H., to Meyertech Incorporated. Fitting with biased locking device for coupling pipes. 4,288,114, Cl. 285-317.000.

Hansen, Finn; and Lodder, Bernhard, to Wavin B.V. Cage construction for use in breeding fur-bearing animals. 4,287,854, Cl. 119-17.000.

Hansen, Karl E.: *See*—
de Ruvo, Alfonso; Norman, Bo; Duffy, Geoffrey G.; Moller, Klaus; Hansen, Karl E.; Felsvang, Karsten S.; and Liborius, Erik, 4,288,317, Cl. 209-139.00A.

Hanson, Douglas R. Device for perforating bakery goods such as English muffins. 4,287,801, Cl. 83-871.000.

Hantschk, Gunther, to Netzsch-Mohnopumpen GmbH. Method and device for the manufacture of helical rotor blanks for helical gear machines. 4,287,743, Cl. 72-98.000.

Hantusch, Gerald H., to International Computers Limited. Circuit structures including integrated circuits. 4,288,808, Cl. 357-68.000.

Haque, Promod, to EMI Limited. Detector construction. 4,288,264, Cl. 156-67.000.

Hara, Hideo: *See*—
Umeda, Haruhiko; Takeuchi, Hidehiro; Uenoyama, Masaru; Ishizuki, Kotoshige; Ando, Hiroyuki; and Hara, Hideo, 4,288,091, Cl. 280-415.00A.

Hara, Yasutoshi: *See*—
Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Hara, Yasutoshi, 4,288,837, Cl. 361-315.000.

Hara, Yukio: *See*—
Kobayashi, Masatoshi; Shimakawa, George; Hara, Yukio; and Fujii, Hiroyuki, 4,288,284, Cl. 156-651.000.

Harada Yukihiro: *See*—
Ida, Shiuichiro; Ohshima, Shoichi; Hirashima, Syunichi; and Harada Yukihiro, 4,287,783, Cl. 74-467.000.

Hardin, Roy T., Jr.; and Kurinko, Carl D., to United States of America, Energy. Connecting apparatus for limited rotary of rectilinear motion (II). 4,288,292, Cl. 176-87.000.

Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, to Thomson-CSF. System for the analysis and the recording of monochromic images. 4,288,822, Cl. 358-296.000.

Harman, Maurice, to Energy Equipment Company Limited, The. Arrangements for feeding fluidizing gas to a fluidized bed combustion apparatus. 4,288,214, Cl. 432-58.000.

Harri, Eugen: *See*—
Traber, Rene P.; Hofmann, Hans; Harri, Eugen; and Max, Kuhn, 4,288,431, Cl. 424-177.000.

Harrison, William H. Brake assembly for skateboard. 4,288,088, Cl. 280-87.04A.

Harroun, Thomas V.; Heller, Lawrence G.; and Vogl, Norbert G., Jr., to International Business Machines Corporation. Serial-parallel-serial CCD memory system with fan out and fan in circuits. 4,288,864, Cl. 365-219.000.

Harstrom, Jan O.: *See*—
Stensson, Bo G.; Harstrom, Jan O.; and Csiba, Jan, 4,287,968, Cl. 188-74.000.

Hart, Thomas G., to Energy Development Associates, Inc. Method of forming hydrogen. 4,288,301, Cl. 204-101.000.

Hart, William F., to Dacam Corporation. Carrier applicator. 4,287,699, Cl. 53-48.000.

Hartenstein, Helmut: *See*—
Dankworth, Juergen; Hartenstein, Helmut; and Hertling, Ludwig, 4,288,340, Cl. 252-99.000.

Hartmann & Braun Aktiengesellschaft: *See*—
Fabinski, Walter; and Deptolla, Udo, 4,288,693, Cl. 250-345.000.
Staab, Joachim; Apel, Willy; and Wolf, Heinz, 4,287,764, Cl. 73-431.000.

Hartmann, Willy: *See*—
Heine, Hans-Georg; Hubner, Armin; and Hartmann, Willy, 4,288,370, Cl. 260-343.600.

Hartmannsgruber, Max; Nigg, Egon; and Hack, Kurt, to Zinser Textilmaschinen GmbH, Firma. Mountable tube for a textile spindle. 4,287,711, Cl. 57-130.000.

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Hashimoto, Hideo; and Kaneda, Tokuzo, to Ricoh Co., Ltd. Sheet feeding device. 4,288,068, Cl. 271-125.000.

Hashimoto, Shunichi: *See*—
Kirino, Osamu; Hashimoto, Shunichi; Matsumoto, Hiroshi; and Oshio, Hiromichi, 4,288,244, Cl. 71-118.000.

Hass, Jurgen, to Daimler-Benz Aktiengesellschaft. Thermostatic control valve. 4,288,031, Cl. 236-34.500.

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Hatano, Masashi: *See*—
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Hatano, Masashi; Hagiwara, Tatsuo; Mikamo, Masaaki; Ebihara, Yoshimasa; Tomura, Yasutomo; and Imai, Keiji, 4,288,166, Cl. 366-149.000.

Hauck, Frederic P.: *See*—
Sundeen, Joseph E.; Dejneka, Tamara; and Hauck, Frederic P., 4,288,456, Cl. 424-330.000.

Haugwitz, Rudiger D., to E. R. Squibb & Sons, Inc. Dithioacylproline derivatives. 4,288,368, Cl. 260-326.350.

Hauni-Werke Korber & Co. KG: *See*—
Heitmann, Uwe; Lorenzen, Heinz-Christen; Wahle; Gunter; and Dahlgrun, Rolf, 4,287,754, Cl. 73-38.000.
Henle, Karl; and von Wichert, Nils, 4,287,703, Cl. 53-449.000.

Hawks, George H., III: *See*—
Myers, Drewfus Y., Jr.; and Hawks, George H., III, 4,288,511, Cl. 430-17.000.

Hayakawa, Hideharu: *See*—
Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, 4,288,251, Cl. 501-105.000.

Hayakawa, Shigeru: *See*—
Wasa, Kiyotaka; Tohda, Takao; Yokoyama, Kazuo; Hirota, Eiichi; and Hayakawa, Shigeru, 4,288,307, Cl. 204-192.00D.

Hayakawa, Yoshihiro; and Fukukita, Hiroshi, to Matsushita Electric Industrial Company, Limited. Beam deflection method and apparatus for sector scan ultrasound imaging systems. 4,287,768, Cl. 73-626.000.

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Fujii, Tadashiro; Yaginuma, Satoshi; Muto, Naoki; and Hayashi, Mitsuo, 4,288,429, Cl. 424-117.000.

Hayashi, Moriyoshi: *See*—
Matsubara, Isamu; and Hayashi, Moriyoshi, 4,287,697, Cl. 52-403.000.

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Kinoshita, Harumi; Hayashi, Yoshiaki; and Saito, Tadao, 4,288,478, Cl. 428-35.000.

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Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Hara, Yasutoshi, 4,288,837, Cl. 361-315.000.

Heckman, Russell W.; and Nickey, George A., to Owens-Illinois, Inc. Power preconditioning for electrostatic application. 4,288,466, Cl. 427-28.000.

Heckmann, Wolfgang: *See*—
Epper, Wolfgang; and Heckmann, Wolfgang, 4,288,029, Cl. 233-20.00A.

Heijs, Karel A. G.; Dechamps, Antonius J.; and de Jong, Robert L., to N.V. Papierfabriek Gennep. Method of and arrangement for de-inking fiber. 4,288,319, Cl. 209-166.000.

Heiman, John H. Machine for forming curved conduits. 4,287,742, Cl. 72-49.000.

Heimke, Gunther; Plester, Dietrich; and Jahnke, Klaus, to Friedrichsfeld GmbH. Auditory ossicle prosthesis. 4,287,616, Cl. 3-1.900.

Heindl, Christine: *See*—
Leibenzeder, Siegfried; and Heindl, Christine, 4,287,848, Cl. 118-401.000.

Heine, Hans-Georg; Hubner, Armin; and Hartmann, Willy, to Bayer Aktiengesellschaft. Halogenovinyl-substituted tetra-hydrofuran-2-ones. 4,288,370, Cl. 260-343.600.

Heinen, Leo: *See*—
Elsner, Emil; and Heinen, Leo, 4,287,933, Cl. 164-452.000.

Heinrich Kopp GmbH & Co. KG., Firma: *See*—
Arnhold, Hans; and Flohr, Peter, 4,288,768, Cl. 335-18.000.

Heisterberg, Milton W., to GATX Tank Erection Corporation. Secondary seal for floating roof storage tank. 4,287,999, Cl. 220-222.000.

Heitmann, Uwe; Lorenzen, Heinz-Christen; Wahle, Gunter; and Dahlgrun, Rolf, to Hauni-Werke Korber & Co. KG. Apparatus for and method of multiple testing of wrappers of cigarettes or the like. 4,287,754, Cl. 73-38.000.

Hek, Dirk G.: *See*—
Van Der Vegte, Jan; and Hek, Dirk G., 4,288,838, Cl. 361-383.000.

Heller, Lawrence G.: *See*—
Harroun, Thomas V.; Heller, Lawrence G.; and Vogl, Norbert G., Jr., 4,288,864, Cl. 365-219.000.

Helliwell, Bradley A.: *See*—
McDonald, John C.; Baichtal, James R.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig P., 4,288,870, Cl. 370-56.000.

Henderson, Richard E. Cover assembly for attic fans. 4,287,815, Cl. 98-43.00R.

Henig, Hans. Process and apparatus for drying pieces in bulk in a plating barrel. 4,287,672, Cl. 34-28.000.

Henk, Keith L., to Pako Corporation. Variable volume peristaltic pump. 4,288,205, Cl. 417-477.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Roland, Wolf-Achim; and Bechstedt, Wolfgang, 4,288,225, Cl. 8-137.000.
Wilsberg, Heinz-Manfred, 4,288,339, Cl. 252-90.000.
Henle, Karl; and von Wichert, Nils, to Hauni-Werke Korber & Co. KG. Method and apparatus for filling and sealing containers. 4,287,703, Cl. 53-449.000.
Hennessy, Michael J. Fecal examining device. 4,288,316, Cl. 209-17.000.
Henningson, Durham & Richardson, Inc.: *See*—
Baker, Leroy E.; and Butterfield, Barry L., 4,288,175, Cl. 405-117.000.
Henzi, Beat: *See*—
Gertisser, Berthold; and Henzi, Beat, 4,288,227, Cl. 8-655.000.
Herchenbach, Horst; Ramesohl, Hubert; and Fleischer, Joachim, to Klockner-Humboldt-Deutz AG. Method and apparatus for the heat treatment of fine-grained material. 4,288,213, Cl. 432-14.000.
Hercules Incorporated: *See*—
Richwine, John R., 4,288,576, Cl. 525-349.000.
Hermann Berstorff Maschinenbau GmbH: *See*—
Koch, Klaus, 4,288,405, Cl. 422-111.000.
Hernqvist, Karl G., to RCA Corporation. CRT With means for suppressing arcing therein. 4,288,719, Cl. 313-457.000.
Herriott, Leslie V. Combination lock mechanism. 4,287,734, Cl. 70-333.00A.
Hertling, Ludwig: *See*—
Dankworth, Juergen; Hartenstein, Helmut; and Hertling, Ludwig, 4,288,340, Cl. 252-99.000.
Hessari, Manouchahr F., to A.P.V. Company Limited, The. Plate heat exchanger. 4,287,945, Cl. 165-167.000.
Hesse, Heinz: *See*—
Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; Kunz, Johann; Lemke, Werner; and Sohnle, Rudiger, 4,288,711, Cl. 310-68.00D.
Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; and Sohnle, Rudiger, 4,288,712, Cl. 310-91.000.
Hetz, Heinz K., to Yarway Corporation. Steam trap including interchangeable body member and insert assembly. 4,288,032, Cl. 236-56.000.
Hewett, Charley L., to Kem-O-Kleen, Inc. Monoflow ball valve and system. 4,287,912, Cl. 137-516.270.
Hewlett-Packard Company: *See*—
Brown, Lawrence E.; Bauer, James L.; and Scheck, Gerald W., 4,288,282, Cl. 156-630.000.
Heymes, Rene, to Roussel Uclaf. Cephalosporanic acid derivatives. 4,288,434, Cl. 424-246.000.
Hibino, Yozo; Oizumi, Junichi; Nishida, Hideo; Nakano, Yoshiyuki; and Ohmachi, Hiroshi, to Hitachi, Ltd. Method of controlling multistage centrifugal compressor equipment. 4,288,198, Cl. 415-1.000.
Hicks, Alan A.: *See*—
Allen, Robert K.; Hicks, Alan A.; and Disko, Harry, 4,287,680, Cl. 46-1.00R.
Higashikawa, Katsunori: *See*—
Yoshida, Tetsu; and Higashikawa, Katsunori, 4,288,849, Cl. 364-102.000.
Higgins, Raymond: *See*—
Hutchings, Graham J.; and Higgins, Raymond, 4,288,372, Cl. 260-346.750.
Higuchi, Kouichi: *See*—
Konishikawa, Kaoru; Sasaki, Shunsuke; Higuchi, Kouichi; and Hirose, Fuminori, 4,288,840, Cl. 361-410.000.
Hill, Richard F.: *See*—
Weber, Willis W.; Hill, Richard F.; and Weeks, Thomas J., Jr., 4,288,410, Cl. 422-233.000.
Hill, Roy K., to Sperry Corporation. Mark sensing detector. 4,288,701, Cl. 250-569.000.
Hilti Aktiengesellschaft: *See*—
Gassman, Horst-Detlef; and Wohlwend, Ernst, 4,287,656, Cl. 29-432.000.
Himmetsberger, Alois: *See*—
Wittmann, Heinz; and Himmetsberger, Alois, 4,288,095, Cl. 280-625.000.
Hineborg, James R.; and Lopez, Efrain, to AMF Incorporated. Tire buffing blade. 4,287,648, Cl. 29-79.000.
Hinkel, Holger; and Kraus, Georg, to International Business Machines Corporation. Ion source having improved cathode. 4,288,716, Cl. 313-230.000.
Hinz, Claus-Dieter; and Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Oxygen respirator container for an oxygen releasing chemical cartridge. 4,287,887, Cl. 128-202.260.
Hirao, Motohisa: *See*—
Kajimura, Takashi; Hirao, Motohisa; Nakamura, Michiharu; Kuroda, Takao; Yamashita, Shigeo; and Umeda, Jun-Ichi, 4,288,757, Cl. 331-94.50H.
Hirashima, Syunichi: *See*—
Ida, Shiuichiro; Ohshima, Shoichi; Hirashima, Syunichi; and Harada Yukihiro, 4,287,783, Cl. 74-467.000.
Hiromae, Yoshitaka; Nakamura, Kazuo; Wada, Toshiya; and Katoh, Hirotada, to Nippon Steel Corporation. Insulating coating compositions applied on electrical steel sheets. 4,288,492, Cl. 428-336.000.
Hirose, Fuminori: *See*—
Konishikawa, Kaoru; Sasaki, Shunsuke; Higuchi, Kouichi; and Hirose, Fuminori, 4,288,840, Cl. 361-410.000.
Hirose, Yasunori, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with timbre selection. 4,287,804, Cl. 84-1.190.
Hirota, Eiichi: *See*—
Senno, Harufumi; Sakakima, Hiroshi; Yanagiuchi, Yukihiro; Inoue, Tsuneo; Yamaguchi, Masatsugu; and Hirota, Eiichi, 4,288,260, Cl. 148-121.000.
Wasa, Kiyotaka; Tohda, Takao; Yokoyama, Kazuo; Hirota, Eiichi; and Hayakawa, Shigeru, 4,288,307, Cl. 204-192.00D.
Hirschorn, Martin: *See*—
Ingard, Uno; Morgan, James A.; and Hirschorn, Martin, 4,287,962, Cl. 181-224.000.
Hisazumi, Nobuyuki; Yamamoto, Masataka; and Uehara, Tsutomu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Laminated packing material with a high gas-impermeablility and an advantageous workability. 4,288,488, Cl. 428-214.000.
Hitachi, Ltd.: *See*—
Hibino, Yozo; Oizumi, Junichi; Nishida, Hideo; Nakano, Yoshiyuki; and Ohmachi, Hiroshi, 4,288,198, Cl. 415-1.000.
Kajimura, Takashi; Hirao, Motohisa; Nakamura, Michiharu; Kuroda, Takao; Yamashita, Shigeo; and Umeda, Jun-Ichi, 4,288,757, Cl. 331-94.50H.
Kashioka, Seiji; Shima, Yoshihiro; Miyatake, Takafumi; Ejiri, Masakazu; and Obata, Osamu, 4,288,816, Cl. 358-138.000.
Ohhinata, Ichiro; Ohkoshi, Seiei; and Suzuki, Hideo, 4,288,862, Cl. 365-181.000.
Sakata, Shinji; Yokota, Hirakazu; Shimizu, Tasuku; and Otawara, Yasuhiko, 4,288,677, Cl. 219-121.0ED.
Umezaki, Hiroshi; Nishida, Hideki; Tsumita, Norikazu; Yamada, Hirozi; Kaneko, Katsuhiro; and Koiso, Nagatugu, 4,288,283, Cl. 156-643.000.
Hitachi Metals, Ltd.: *See*—
Yamashita, Keitaro; and Noguchi, Kohji, 4,288,515, Cl. 430-100.000.
Hitco: *See*—
Lewis, Kenneth W.; and Shaffer, Robert C., 4,288,568, Cl. 525-111.000.
Hodes, Gary: *See*—
Avigal, Yitzchak; Manassen, Joost; Hodes, Gary; and Cahen, David, 4,288,502, Cl. 429-111.000.
Hodkinson, Harold: *See*—
Parsons, David; and Hodkinson, Harold, 4,288,126, Cl. 303-6.00C.
Hoechst Aktiengesellschaft: *See*—
Bodenbenner, Kurt; Muller, Gerhard; and Perkow, Helmut, 4,288,211, Cl. 431-346.000.
Mitzlaff, Michael; Cramer, Jurgen; and Pistorius, Rudolf, 4,288,300, Cl. 204-59.00R.
Schmidt, Hans-Joachim; Wunder, Friedrich; Arpe, Hans-Jurgen; and Leupold, Ernst I., 4,288,558, Cl. 518-716.000.
Sprintschnik, Gerhard; and Uhlig, Fritz, 4,288,520, Cl. 430-169.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Martin, Lawrence L.; and Worm, Manfred, 4,288,623, Cl. 564-307.000.
Hoeh, Frederick W., deceased (by Hoeh, Inga, executrix), to Westinghouse Electric Corp. Method of making a convoluted tubular envelope for a compact electric discharge lamp. 4,288,239, Cl. 65-110.000.
Hoeh, Inga, executrix: *See*—
Hoeh, Frederick W., deceased, 4,288,239, Cl. 65-110.000.
Hoenisch, Walter H., to King-Seeley Thermos Co. Ice transport and dispensing system. 4,287,725, Cl. 62-344.000.
Hoffman-La Roche Inc.: *See*—
Kramer, Michael J.; and Tilley, Jefferson W., 4,288,454, Cl. 424-321.000.
Hoffman, Luther A.; and Schmidt, Friedrich W., to Sharpoint, Inc. Suture holder. 4,287,987, Cl. 206-63.300.
Hoffmann, Herwig: *See*—
Schuster, Ludwig; Raff, Paul; Hoffmann, Herwig; Schneider, Rolf; and Flickinger, Erich, 4,288,640, Cl. 568-855.000.
Hoffmann-La Roche Inc.: *See*—
Olson, Gary L., 4,288,614, Cl. 560-240.000.
Hoffmann, Rudiger; and Feichtiger, Dieter, to Daimler-Benz Aktiengesellschaft. Control valve for pneumatic conduits. 4,287,915, Cl. 137-625.500.
Hofler, Alois, to Lifehaus Corporation of Texas. Prefabricated building. 4,287,695, Cl. 52-241.000.
Hofman, Emiel A.: *See*—
Lemahieu, Raymond G.; Depoorter, Henri; and Hofman, Emiel A., 4,288,534, Cl. 430-522.000.
Hofmann, Hans: *See*—
Traber, Rene P.; Hofmann, Hans; Harri, Eugen; and Max, Kuhn, 4,288,431, Cl. 424-177.000.
Höjas, Hans; Leutgob, Alois; and Gsottbauer, Johann, to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H. Method of controlling the continuous movement of stock being rolled in a rolling mill train. 4,287,738, Cl. 72-20.000.
Holcroft: *See*—
Gupta, Bhupendra K.; Shefsiek, Paul K.; and Fraim, Freeman W., 4,288,062, Cl. 266-88.000.
Holladay, Joseph W., to Jo-Pat, Incorporated. Embroidery thread organizer. 4,288,010, Cl. 223-106.000.
Holland, David: *See*—
Crosby, John; Holland, David; Laidler, Dale A.; and Milner, David J., 4,288,387, Cl. 260-465.00D.
Holland, Gerhard; and Nowak, Rudolf. Process for the selective production of a plurality of individual pure halides and/or halide mixtures from a mixture of solid oxides. 4,288,411, Cl. 423-1.000.
Holland, Steven W., to General Motors Corporation. Method and apparatus for automatically determining sheet metal strain. 4,288,852, Cl. 364-508.000.

Hollandsche Beton Groep N.V.: *See*—
Jansz, Joost W., 4,288,178, Cl. 405-228.000.
Holley, Danforth; and Holley, Danforth E., to Holly International Company. Portable solar heater structure. 4,287,878, Cl. 126-429.000.
Holley, Danforth E.: *See*—
Holley, Danforth; and Holley, Danforth E., 4,287,878, Cl. 126-429.000.
Hollmayer, Walter, to Goerz Electro Gesellschaft m.b.H. Stylus changing device. 4,288,798, Cl. 346-139.00R.
Holly International Company: *See*—
Holley, Danforth; and Holley, Danforth E., 4,287,878, Cl. 126-429.000.
Holmes, Robert E., to Tektronix, Inc. Passivated thin-film hybrid circuits. 4,288,776, Cl. 338-308.000.
Holy, Norman L.; and Nalesnik, Theodore E., to Western Kentucky University. Production of cyclic ethers. 4,288,369, Cl. 260-333.000.
Holz, Karl-Heinz, to G. Siempelkamp GmbH & Co. Method of and apparatus for applying veneer foils to a board. 4,288,274, Cl. 156-364.000.
Homma, Hiroshige: *See*—
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,288,438, Cl. 424-251.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Enokimoto, Akito; Tsuchiya, Toshio; Masuda, Tatsuo; and Takano, Suwaji, 4,288,096, Cl. 280-694.000.
Honeywell Inc.: *See*—
Egli, Werner H.; Kuhlmann, Dennis; and Wier, Jack E., 4,287,809, Cl. 89-41.0EA.
Honeywell Information Systems Inc.: *See*—
Kindell, Jerry L.; and Flynn, Richard T., 4,288,850, Cl. 364-200.000.
Honnen, Lewis R.: *See*—
Lewis, Robert A.; and Honnen, Lewis R., 4,288,612, Cl. 560-159.000.
Hoogovens Ijmuiden, B.V.: *See*—
Bronsveld, Frederik A., 4,287,983, Cl. 198-817.000.
Hooker Chemicals & Plastics Corp.: *See*—
Fuller, Willard A., 4,288,286, Cl. 162-30.00R.
Hooper, David C.; Johnson, George A.; and Peter, Donald, to Lever Brothers Company. Detergent product containing deodorant compositions. 4,288,341, Cl. 252-107.000.
Hopfer, Samuel, to General Microwave Corporation. Microstrip coupler for microwave signals. 4,288,761, Cl. 333-116.000.
Hopfer, Samuel, to General Microwave Corporation. Analog phase shifter. 4,288,763, Cl. 333-164.000.
Horeth, Dietmar: *See*—
Mayr, Ulrich; Horeth, Dietmar; and Kusmierz, Hans, 4,288,168, Cl. 400-322.000.
Hori, Kiyoharu, to Rion Co., Ltd. Electropalatograph. 4,287,895, Cl. 128-777.000.
Horie, Hideo: *See*—
Kanisawa, Hideo; Kitahata, Tamio; and Horie, Hideo, 4,288,535, Cl. 430-569.000.
Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, to Ricoh Co., Ltd. Variable-charge type ink-jet printer. 4,288,797, Cl. 346-75.000.
Horino, Takeshi: *See*—
Kiyama, Yosito; Tachibana, Shinichi; Yamashita, Riichiro; and Horino, Takeshi, 4,288,688, Cl. 235-384.000.
Horn, James M.; Johnston, Byron E.; Napier, Roger P.; and Williams, Thomas N., to Mobil Oil Corporation. Process for the preparation of dialkyl phosphoric acids. 4,288,392, Cl. 260-983.000.
Hornung, Ewald. Screwing heads. 4,287,923, Cl. 81-429.000.
Horstmann, Harald: *See*—
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,288,446, Cl. 424-273.00P.
Horton, James A., to Jersey Nuclear-Avco Isotopes, Inc. Laser pulse shaping. 4,288,691, Cl. 250-281.000.
Hotta, Masashi, to Shimano Industrial Company, Limited. Heat insulating box. 4,287,943, Cl. 165-104.190.
Hou, Kenneth C.; and Ostreicher, Eugene A., to AMF Incorporated. Method for removing cationic contaminants from beverages. 4,288,462, Cl. 426-423.000.
Houdek, Mark R.: *See*—
Gallagher, Bernard J.; Wennerstrom, Erling G.; and Houdek, Mark R., 4,288,103, Cl. 285-39.000.
Houdeshell, Donald D. Three speed fluid flow control valve. 4,287,911, Cl. 137-513.700.
Hourticolon, Roland: *See*—
Meyer, Rudolf; Koepke, Gunther; and Hourticolon, Roland, 4,288,469, Cl. 427-57.000.
House, Richard F., to Container Corporation of America. Syringe sheath guide. 4,287,988, Cl. 206-365.000.
Houston, James E., to Evaporator Technology Corporation. Apparatus for forming a vortex. 4,288,285, Cl. 159-1.00C.
Howell, Edward K., to General Electric Company. Ambient temperature responsive trip device for static trip circuit breakers. 4,288,769, Cl. 335-173.000.
Howell, Edward K., to General Electric Company. Lightning arrestor. 4,288,833, Cl. 361-124.000.
Howes, David R., executor: *See*—
Ledig, Kurt W., deceased; and Howes, David R., executor, 4,288,595, Cl. 544-250.000.
Hoya Corporation: *See*—
Yamashita, Toshiharu, 4,288,250, Cl. 501-78.000.
Hsieh, John T. T., to Arco Polymers, Inc. High efficiency catalyst for high bulk density polyethylene. 4,288,578, Cl. 526-119.000.
Huang, John S.: *See*—
Baker, Edward G.; and Huang, John S., 4,287,950, Cl. 166-273.000.
Huber, Manfred: *See*—
Erhardt, Manfred; Fendt, Werner; and Huber, Manfred, 4,287,659, Cl. 29-568.000.
Hubner, Armin: *See*—
Heine, Hans-Georg; Hubner, Armin; and Hartmann, Willy, 4,288,370, Cl. 260-343.600.
Huchette, Michel: *See*—
Devos, Francis; and Huchette, Michel, 4,288,619, Cl. 562-554.000.
Huebner, David J.; and Weyenberg, Donald R., to Dow Corning Corporation. Polysiloxane emulsion elastomers reinforced with emulsified organo-silicone copolymers. 4,288,356, Cl. 260-29.6NR.
Huinink, Heinrich, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic vehicle tire. 4,287,929, Cl. 152-354.00R.
Hulbert, Clarence E., Jr.: *See*—
Rasmussen, Hans W., 4,288,423, Cl. 423-510.000.
Hunt, Robert T. Throttle setting device. 4,287,785, Cl. 74-488.000.
Hunter, James B.; and McGuire, George, to Johnson Matthey Inc. Catalyst for catalytic heat exchange. 4,288,346, Cl. 252-437.000.
Hurter, Rudolf, to Ciba-Geigy Corporation. Novel azo dyes having 2-amino-5-aminomethyl-7-sulfo naphthalene coupling moiety. 4,288,363, Cl. 260-155.000.
Hussar, John F.: *See*—
Zestermann, Mary J.; and Hussar, John F., 4,288,361, Cl. 260-45.8NZ.
Hutchings, Graham J.; and Higgins, Raymond, to Imperial Chemical Industries Limited. Production of maleic anhydride. 4,288,372, Cl. 260-346.750.
Hutson Corporation, The: *See*—
Fewel, Kenneth J., 4,288,165, Cl. 366-124.000.
Hutton, Stanley P., to Ferraris Development and Engineering Company Limited. Fluid flow measuring apparatus. 4,287,775, Cl. 73-861.790.
Hydra-Mac, Inc.: *See*—
Steiger, Bruce W., 4,287,961, Cl. 180-68.00R.
Hydril Company: *See*—
Krause, William F.; and Turner, Edwin C., 4,287,954, Cl. 166-322.000.
ICI Australia Limited: *See*—
Keith, Donald G.; and Flecknoe-Brown, Anthony, 4,288,401, Cl. 264-550.000.
Ida, Shiuichiro; Ohshima, Shoichi; Hirashima, Syunichi; and Harada Yukihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Mechanism for lubricating bearings of a counter shift gear for a gear transmission. 4,287,783, Cl. 74-467.000.
Ideal Toy Corporation: *See*—
Albert, Judith; and Davis, Robert E., 4,287,681, Cl. 46-44.000.
Igarashi, Isao: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,287,859, Cl. 123-51.0BA.
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Ito, Hayami; Nagai, Chiaki; Nakabayashi, Yasuyuki; Igarashi, Kihachiro; Mouri, Kunihiko; and Ikeda, Takashi, 4,288,420, Cl. 423-239.000.
Igel, Anders N. E., to U.S. Philips Corporation. Method and a device for eliminating fixed error disturbances in a pyroelectric vidicon. 4,288,817, Cl. 358-163.000.
Iglesias, Gilberto. Anti-backflow valve for a faucet. 4,287,905, Cl. 137-102.000.
Iijima, Akio: *See*—
Uzawa, Shunichi; Matsumoto, Shigeyuki; Miyazaki, Minoru; Iijima, Akio; and Watanabe, Kunio, 4,288,799, Cl. 346-140.00R.
Iizumi, Tomomitsu, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Control valve. 4,287,812, Cl. 91-420.000.
Ikawa, Kazuo, to Canon Kabushiki Kaisha. Electronic flash device. 4,288,722, Cl. 315-151.000.
Ikeda, Kazuhiro: *See*—
Yoshida, Ikio; Kage, Kouzou; Ikeda, Kazuhiro; and Sato, Yasuo, 4,288,751, Cl. 328-173.000.
Ikeda, Takashi: *See*—
Ito, Hayami; Nagai, Chiaki; Nakabayashi, Yasuyuki; Igarashi, Kihachiro; Mouri, Kunihiko; and Ikeda, Takashi, 4,288,420, Cl. 423-239.000.
Ikenaka, Yoshiharu: *See*—
Sakaguchi, Ryo; and Ikenaka, Yoshiharu, 4,288,181, Cl. 408-15.000.
Ikuta, Yasuhiro; and Matsuo, Masashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system for internal combustion engine. 4,287,866, Cl. 123-568.000.
Illger, Hans-Walter; Dahm, Manfred; and Gonzalez-Dorner, Alberto C., to Bayer Aktiengesellschaft. Flame resistant foam. 4,288,559, Cl. 521-55.000.
Illy, Hugo: *See*—
Kirchmayr, Rudolf; Fussenegger, Werner; and Illy, Hugo, 4,288,560, Cl. 521-90.000.
IMA - Industria Macchine Automatiche S.p.A.: *See*—
Romagnoli, Andrea, 4,288,224, Cl. 493-345.000.
Imada, Takahiko: *See*—
Saima, Tooru; Ohya, Isao; Imada, Takahiko; Sato, Hideo; and Katsuma, Shinichi, 4,288,290, Cl. 176-19.00R.
Imai, Keiji: *See*—
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Hatano, Masashi; Hagiwara, Tatsuo; Mikamo, Masaaki; Ebihara, Yoshimasa; Tomura, Yasutomo; and Imai, Keiji, 4,288,166, Cl. 366-149.000.

Imai, Takashi: *See—*
Yamanaka, Tohr; and Imai, Takashi, 4,288,642, Cl. 568-903.000.
Imamura, Akio; and Katada, Naota, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of time division multiplexed type. 4,287,802, Cl. 84-1.010.
Imoto, Tadasi: *See—*
Norota, Susumu; Kiriyama, Tsutomu; and Imoto, Tadasi, 4,288,484, Cl. 428-113.000.
Imperial Chemical Industries Limited: *See—*
Crosby, John; Holland, David; Laidler, Dale A.; and Milner, David J., 4,288,387, Cl. 260-465.00D.
Hutchings, Graham J.; and Higgins, Raymond, 4,288,372, Cl. 260-346.750.
Roberts, Norman L.; and Whittaker, Graham, 4,288,600, Cl. 546-345.000.
Snowden, Paul; and Steel, Margaret L., 4,288,397, Cl. 264-8.000.
Thorpe, David, 4,288,563, Cl. 521-122.000.
Inada, Kiyotaka: *See—*
Sakamoto, Yoshiyasu; Tamura, Yoichi; Kawaguchi, Kiyohiko; and Inada, Kiyotaka, 4,288,162, Cl. 356-335.000.
Inazaki, Norihisa: *See—*
Kawabata, Shigeo; and Inazaki, Norihisa, 4,288,747, Cl. 324-207.000.
Inco Limited: *See—*
Garritsen, Petrus G. S.; MacVicar, Douglas J.; Young, Daniel P.; and Sojda, John G., 4,288,305, Cl. 204-112.000.
Industrial Acoustics Company: *See—*
Ingard, Uno; Morgan, James A.; and Hirschorn, Martin, 4,287,962, Cl. 181-224.000.
Industrie Pirelli S.p.A.: *See—*
Pacciarini, Antonio; and Bertoldo, Giorgio, 4,288,265, Cl. 156-126.000.
Ingard, Uno; Morgan, James A.; and Hirschorn. Martin, to Industrial Acoustics Company. Packless silencer. 4,287,962, Cl. 181-224.000.
Ingle, Arthur J.: *See—*
Blacker, Allen P.; and Ingle, Arthur J., 4,288,718, Cl. 313-414.000.
Ingle, James E., to Kerr-McGee Corporation. Mining apparatus having an improved coupling assembly. 4,288,125, Cl. 299-30.000.
Inglis, Bruce R.: *See—*
Allen, Roger A.; Inglis, Bruce R.; and Green, Kieron P., 4,287,981, Cl. 198-457.000.
Inman, Hubert W., to Raybestos-Manhattan, Inc. Composite mold for making rubber covered rolls and method for making same. 4,288,058, Cl. 249-134.000.
Inman, Richard. Self propelled pallet truck. 4,287,959, Cl. 180-12.000.
Inoue, Haruo: *See—*
Sano, Takezo; Inoue, Haruo; and Furuta, Akihiro, 4,288,529, Cl. 430-308.000.
Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,288,675, Cl. 219-69.00M.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Cutting area responsive EDM method and apparatus with cyclically interrupted pulse trains. 4,288,675, Cl. 219-69.00M.
Inoue, Tsuneo: *See—*
Senno, Harufumi; Sakakima, Hiroshi; Yanagiuchi, Yukihiro; Inoue, Tsuneo; Yamaguchi, Masatsugu; and Hirota, Eiichi, 4,288,260, Cl. 148-121.000.
Institut Francais du Petrole: *See—*
Cessou, Maurice, 4,287,903, Cl. 137-13.000.
Institute of Nuclear Energy Research: *See—*
Chang, Sir-Sea; Chern, Sheng-Laang; Ting, Gann; and Kuo, Tsai-Shu, 4,288,412, Cl. 423-10.000.
Institute of Technical Sciences of the Serbian Academy of Sciences and Art: *See—*
Jovanovic, Budimir B.; Despic, Aleksandar R.; and Drazic, Dragutin M., 4,288,500, Cl. 428-650.000.
Instrument Development Corp.: *See—*
Dugot, Richard, 4,287,771, Cl. 73-647.000.
Interlake, Inc.: *See—*
Marsden, Brian W. H., 4,288,295, Cl. 202-150.000.
Mossell, Alan T.; Simmons, James R.; and Middleton, Charles G., 4,288,270, Cl. 156-359.000.
Intermountain Research & Develop. Corp.: *See—*
Copenhafer, William C.; and Rauh, Francis, 4,288,419, Cl. 423-190.000.
International Business Machines Corporation: *See—*
Harroun, Thomas V.; Heller, Lawrence G.; and Vogl, Norbert G., Jr., 4,288,864, Cl. 365-219.000.
Hinkel, Holger; and Kraus, Georg, 4,288,716, Cl. 313-230.000.
Kolodzey, James S.; Noel, Francis E., Jr.; and Stilwell, George R., Jr., 4,288,869, Cl. 370-31.000.
Ning, Tak H.; Osburn, Carlton M.; and Yu, Hwa N., 4,288,256, Cl. 148-1.500.
Stoffel, Axel, 4,287,661, Cl. 29-571.000.
Vinal, Albert W., 4,288,708, Cl. 307-309.000.
International Computers Limited: *See—*
Hantusch, Gerald H., 4,288,808, Cl. 357-68.000.
International Harvester Company: *See—*
Chatterjea, Probir K.; and Shore, Daniel B., 4,287,813, Cl. 91-434.000.
Oban, Harold C.; and Peterson, Charles M., 4,288,086, Cl. 280-5.00A.
International Nickel Company, Inc., The: *See—*
Shaw, Stuart W., 4,288,247, Cl. 75-171.000.
International Packings Corporation: *See—*
Braconier, Karl, 4,288,083, Cl. 277-134.000.
International Paper Company: *See—*
Fries, Carl, Jr., 4,288,003, Cl. 221-1.000.
International Standard Electric Corporation: *See—*
Fischer, Bruno; and Vollath, Rainer, 4,288,512, Cl. 430-24.000.
Gingell, Michael J., 4,288,873, Cl. 375-25.000.
International Telephone and Telegraph Corporation: *See—*
Swanson, Arthur F., 4,288,657, Cl. 174-87.000.
Interox Chemicals Limited: *See—*
McCrudden, Joseph E.; and Smith, Alan, 4,288,388, Cl. 260-502.00R.
Inventing S.A.: *See—*
Wallsten, Hans I., 4,288,473, Cl. 427-209.000.
Inventio AG: *See—*
Zeindler, Stephan; and Suss, Hans G., 4,288,859, Cl. 364-900.000.
Iowa State University Research Foundation, Inc.: *See—*
Larock, Richard C., 4,288,613, Cl. 560-231.000.
IRMAC S.p.A.: *See—*
Del Barba, Bruno, 4,287,726, Cl. 66-24.000.
Iron Removal Specialists, Inc.: *See—*
Montgomery, John R., 4,288,328, Cl. 210-713.000.
Ishibashi, Kazuhisa, to Toyo Seikan Kaisha, Ltd. High frequency induction heating apparatus. 4,288,673, Cl. 219-10.690.
Ishida, Masahiko; Haga, Ryoichi; and Odawara, Yoji, to Agency of Industrial Science and Technology, The. Treating process of garbage contained wastes. 4,288,550, Cl. 435-167.000.
Ishida, Tokuji, to Minolta Camera Kabushiki Kaisha. Diaphragm control device for cameras. 4,288,150, Cl. 354-23.00D.
Ishigaki, Isao: *See—*
Machi, Sueo; Ishigaki, Isao; and Sugo, Takanobu, 4,288,467, Cl. 427-44.000.
Ishihara Sangyo Kaisha Ltd.: *See—*
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, 4,288,599, Cl. 546-345.000.
Ishii, Masaji: *See—*
Tanji, Hiroaki; Saito, Mitsuaki; and Ishii, Masaji, 4,288,717, Cl. 313-336.000.
Ishii, Shohju: *See—*
Koshimaru, Hajime; and Ishii, Shohju, 4,287,747, Cl. 72-358.000.
Ishii, Yohio: *See—*
Sakakibara, Tadamori; Matsushima, Yoshihisa; Nagashima, Yukio; Okamoto, Nobukazu; Kaneko, Katsumi; Ishii, Yohio; and Wada, Shozo, 4,288,634, Cl. 568-454.000.
Ishikawa, Katsukiyo: *See—*
Arimatsu, Seiji; Ishikawa, Katsukiyo; Umeda, Yasusi; and Nagata, Koichi, 4,288,517, Cl. 430-110.000.
Ishikawa, Takashi: *See—*
Minamibayashi, Seisaku; Ishikawa, Takashi; and Ogawa, Takashi, 4,288,820, Cl. 358-280.000.
Ishizuki, Kotoshige: *See—*
Umeda, Haruhiko; Takeuchi, Hidehiro; Uenoyama, Masaru; Ishizuki, Kotoshige; Ando, Hiroyuki; and Hara, Hideo, 4,288,091, Cl. 280-415.00A.
Islas, John J., to Victor United, Inc. Compound bow. 4,287,867, Cl. 124-24.00R.
Isomura, Yasuo: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,288,438, Cl. 424-251.000.
Ito, Akira: *See—*
Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Hara, Yasutoshi, 4,288,837, Cl. 361-315.000.
Ito, Fumio: *See—*
Sakurada, Nobuaki; Shinoda, Nobuhiko; Mashimo, Yukio; Ito, Tadashi; and Ito, Fumio, 4,288,154, Cl. 354-23.00D.
Ito, Hayami; Nagai, Chiaki; Nakabayashi, Yasuyuki; Igarashi, Kihachiro; Mouri, Kunihiko; and Ikeda, Takashi, to Electric Power Development Co. Ltd.; and Kawasaki Jukogyo Kabushiki Kaisha. Removal of nitrogen oxides and sulfur oxides by ammonia. 4,288,420, Cl. 423-239.000.
Ito, Kunio: *See—*
Kojima, Hiroshi; Ito, Kunio; Akiyama, Masami; and Tanaka, Takeshi, 4,288,521, Cl. 430-169.000.
Ito, Noriki: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,288,438, Cl. 424-251.000.
Ito, Tadashi: *See—*
Sakurada, Nobuaki; Shinoda, Nobuhiko; Mashimo, Yukio; Ito, Tadashi; and Ito, Fumio, 4,288,154, Cl. 354-23.00D.
ITT Industries, Inc.: *See—*
Adam, Fritz G., 4,288,863, Cl. 365-182.000.
Iwasaki, Kyuhachiro: *See—*
Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,288,797, Cl. 346-75.000.
Iwatsu Electric Co., Ltd.: *See—*
Kato, Takefumi; and Abe, Haruo, 4,288,720, Cl. 315-13.0ST.
IXL Manufacturing Co., Inc.: *See—*
Keathley, Bob N., 4,287,640, Cl. 16-110.00R.
J. H. Fenner & Co. Limited: *See—*
Watts, Gilbert E., 4,288,474, Cl. 427-290.000.
J. I. Case Company: *See—*
Benson, Samuel L., 4,288,190, Cl. 411-511.000.
J. M. Huber Corporation: *See—*
Wagner, Joseph E., III; and Williams, Lloyd E., 4,288,342, Cl. 252-140.000.
J. T. Baker Chemical Co.: *See—*
Gray, Gary M., 4,288,635, Cl. 568-483.000.

Jaccard, Andre R.; and Voss, Karl H. Meat tenderizing apparatus. 4,287,642, Cl. 17-25.000.

Jacobs, Paul G. Wet and dry vacuum cleaner. 4,287,635, Cl. 15-321.000.

Jacques, Pierre, to Cellu-Craft Products Company. Solar heating panel unit and system therefor. 4,287,876, Cl. 126-426.000.

Jaeggi, Knut A.: *See—*
Haas, Georges; Rossi, Alberto; Jaeggi, Knut A.; and Sele, Alex, 4,288,450, Cl. 424-283.000.

Jahnke, Klaus: *See—*
Heimke, Gunther; Plester, Dietrich; and Jahnke, Klaus, 4,287,616, Cl. 3-1.900.

Jamerson, Jackie D.: *See—*
Billig, Ernst; Jamerson, Jackie D.; and Pruett, Roy L., 4,288,380, Cl. 260-429.00R.

Janome Sewing Machine Co., Ltd.: *See—*
Ozaki, Yoshiaki, 4,287,843, Cl. 112-277.000.

Janoski, Edward J.; Schneider, Abraham; and Ware, Richard E., to Suntech, Inc. Process for isomerization of tetrahydrodimethyldicyclopentadiene. 4,288,644, Cl. 585-360.000.

Jans, Karl: *See—*
Schuster, Hans-Dieter; Jans, Karl; and Ohlendorf, Rolf, 4,287,716, Cl. 60-276.000.

Janssen, Antonius J.: *See—*
Enzlin, Theodoor H.; and Janssen, Antonius J., 4,288,807, Cl. 357-46.000.

Janssens, Wilhelmus: *See—*
Carael, Frans; Claeys, Daniel A.; and Janssens, Wilhelmus, 4,288,522, Cl. 430-213.000.

Jansz, Joost W., to Hollandsche Beton Groep N.V. Apparatus for generating a retropulsive force on a body such as a pile. 4,288,178, Cl. 405-228.000.

Japan Atomic Energy Research Institute: *See—*
Machi, Sueo; Ishigaki, Isao; and Sugo, Takanobu, 4,288,467, Cl. 427-44.000.

Japikse, Cornelis H.; and Simon, Irwin B., to Procter & Gamble Company, The. Method of preparing an enriched peanut oil peanut butter stabilizer. 4,288,378, Cl. 260-409.000.

Jensen, Per, to Solberg, Rino. Apparatus for grinding plane, annular surfaces, especially on faying rings in gate valves. 4,287,688, Cl. 51-241.0VS.

Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Horton, James A., 4,288,691, Cl. 250-281.000.

Jinnai, Koichiro: *See—*
Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,288,797, Cl. 346-75.000.

Jinnouchi, Hidenobu: *See—*
Sekiwa, Seiichiro; Kawate, Kenji; and Jinnouchi, Hidenobu, 4,288,258, Cl. 148-13.000.

Jinnouchi, Takeshi, to Nippon Oil Seal Industry, Co., Ltd. Bellows apparatus. 4,287,814, Cl. 92-43.000.

Jipping, Max J.: *See—*
Roorda, Herm J.; and Jipping, Max J., 4,288,245, Cl. 75-0.50R.

Jo-Pat, Incorporated: *See—*
Holladay, Joseph W., 4,288,010, Cl. 223-106.000.

Joh. A. Benckiser GmbH: *See—*
Dankworth, Juergen; Hartenstein, Helmut; and Hertling, Ludwig, 4,288,340, Cl. 252-99.000.

John Wyeth & Brother Limited: *See—*
Crossley, Roger, 4,288,439, Cl. 424-263.000.

Johnsen, Richard G.: *See—*
Griffith, Gary L.; Johnsen, Richard G.; and Sherman, Charles J., 4,288,140, Cl. 339-74.00R.

Johnson, Alfred L., Jr.; and Peckham, Victor A., to LaJet Energy Company. Curved reflector with adjustable focal length. 4,288,146, Cl. 350-295.000.

Johnson, Bruce K., to Polaroid Corporation. Automatic strobe camera. 4,288,153, Cl. 354-27.000.

Johnson, Clarence. Force transducer. 4,287,776, Cl. 73-862.520.

Johnson, Francis; and Kim, Kyoung S., to Research Corporation. Synthesis of anthracyclines. 4,288,608, Cl. 560-53.000.

Johnson, Garland A.; and Peuler, Jacob D., to Upjohn Company, The. Radioenzymatic assay of catecholamines. 4,288,542, Cl. 435-15.000.

Johnson, George A.: *See—*
Hooper, David C.; Johnson, George A.; and Peter, Donald, 4,288,341, Cl. 252-107.000.

Johnson, Glenn W., Jr. Self-sealing valve. 4,287,920, Cl. 141-85.000.

Johnson, John. Indoor barbeque cooking device. 4,287,870, Cl. 126-25.00C.

Johnson, Matthey & Co., Limited: *See—*
Enga, Bernard E., 4,287,856, Cl. 122-4.00D.

Johnson Matthey Inc.: *See—*
Hunter, James B.; and McGuire, George, 4,288,346, Cl. 252-437.000.

Johnson, Ralph E.; and Biscaro, Reno P., to Cominco Ltd. Cathode and edge stick assembly. 4,288,312, Cl. 204-281.000.

Johnston, Byron E.: *See—*
Horn, James M.; Johnston, Byron E.; Napier, Roger P.; and Williams, Thomas N., 4,288,392, Cl. 260-983.000.

Jones, Barry E.: *See—*
Leonard, Ian C. A.; and Jones, Barry E., 4,287,808, Cl. 87-44.000.

Jones, Brenton E.: *See—*
Reusser, Robert E.; and Jones, Brenton E., 4,288,496, Cl. 428-447.000.

Jonner, Wolf-Dieter: *See—*
Leiber, Heinz; Jonner, Wolf-Dieter; and Goebels, Hermann-Josef, 4,288,127, Cl. 303-111.000.

Jorgensen, Knud D., to Etablissement Dentaire Ivoclar. Method of producing uniform synthetic resin coatings on working casts for dental applications. 4,288,472, Cl. 427-133.000.

Joshi, Ashok V.; and Sholette, William P., to Ray-O-Vac Corporation. High energy density solid state cell. 4,288,505, Cl. 429-191.000.

Jovanovic, Budimir B.; Despic, Aleksandar R.; and Drazic, Dragutin M., to Institute of Technical Sciences of the Serbian Academy of Sciences and Art. Electrochemically active aluminum alloy and composite. 4,288,500, Cl. 428-650.000.

Joyner, Frederick B.: *See—*
Trotter, Jimmy R.; McConnell, Richard L.; and Joyner, Frederick B., 4,288,358, Cl. 260-31.80M.

Jubinville, Roland C. Spray gun. 4,288,036, Cl. 239-345.000.

Judd, Duncan B.; Clitherow, John W.; Price, Barry J.; and Bradshaw, John, to Glaxo Group Limited. Substituted furan compounds and pharmaceutical compositions containing them. 4,288,443, Cl. 424-267.000.

Jugl, Herbert F.: *See—*
Leonard, Murray; and Jugl, Herbert F., 4,288,210, Cl. 431-263.000.

Julian, Kenneth A.: *See—*
Julian, Victor J.; and Julian, Kenneth A., 4,288,504, Cl. 429-179.000.

Julian, Victor J.; and Julian, Kenneth A. Sealed battery cable termination. 4,288,504, Cl. 429-179.000.

Kabel- und Metallwerke Gutehoffnungshutte A.G.: *See—*
Schwartze, Hansjurgen, 4,288,107, Cl. 285-137.00R.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Oldfield, Thomas A.; Smith, Edward D.; and Furukawa, Hideo, 4,287,717, Cl. 60-606.000.
Umeda, Haruhiko; Takeuchi, Hidehiro; Uenoyama, Masaru; Ishizuki, Kotoshige; Ando, Hiroyuki; and Hara, Hideo, 4,288,091, Cl. 280-415.00A.

Kabushiki Kaisha Meiji Gomu Kasei: *See—*
Aoki, Hisashi, 4,287,836, Cl. 108-51.100.

Kabushiki Kaisha Suwa Seikosha: *See—*
Kobayashi, Masatoshi; Shimakawa, George; Hara, Yukio; and Fujii, Hiroyuki, 4,288,284, Cl. 156-651.000.

Kage, Kouzou: *See—*
Yoshida, Ikio; Kage, Kouzou; Ikeda, Kazuhiro; and Sato, Yasuo, 4,288,751, Cl. 328-173.000.

Kagome, Ltd.: *See—*
Ukai, Nobuo; Funado, Akira; and Yokota, Tethuya, 4,287,821, Cl. 99-646.00C.

Kahling, Joachim: *See—*
Engel, Wolfhard; Trummlitz, Gunter; Seeger, Ernst; and Kahling, Joachim, 4,288,437, Cl. 424-246.000.

Kainz, Norbert. Apparatus for conveying tennis balls to a ball-throwing machine. 4,288,074, Cl. 273-29.00A.

Kajimura, Takashi; Hirao, Motohisa; Nakamura, Michiharu; Kuroda, Takao; Yamashita, Shigeo; and Umeda, Jun-Ichi, to Hitachi, Ltd. Semiconductor laser device. 4,288,757, Cl. 331-94.50H.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. N,N-Dialkylamino diphenylamines and the use thereof in compositions for dyeing keratinic fibers. 4,288,622, Cl. 564-194.000.

Kameda, Kinya: *See—*
Miki, Tosaku; Eriguchi, Akashi; Abiko, Yasushi; and Kameda, Kinya, 4,288,441, Cl. 424-266.000.

Kameyama, Tsutomu, to Taisho Pharmaceutical Co., Ltd. Furoindoles. 4,288,596, Cl. 546-198.000.

Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, to Fujisawa Pharmaceutical Co., Ltd. 3,7-Disubstituted-3-cephem-4-carboxylic acid compounds and pharmaceutical antibacterial compositions containing them. 4,288,435, Cl. 424-246.000.

Kanazawa, Hiroyuki; and Futagami, Mikio, to Sumitomo Chemical Co. Ltd.; and Nippon Sheet Glass. Coating composition and method for the improvement of surface hardness of article by the use thereof. 4,288,357, Cl. 260-31.20N.

Kanda, Kaoru, to Sigma Corporation. Appliance for adhering a sensing marker on a medium for recording information. 4,288,281, Cl. 156-540.000.

Kaneda, Tokuzo: *See—*
Hashimoto, Hideo; and Kaneda, Tokuzo, 4,288,068, Cl. 271-125.000.

Kaneko, Katsuhiro: *See—*
Umezaki, Hiroshi; Nishida, Hideki; Tsumita, Norikazu; Yamada, Hirozi; Kaneko, Katsuhiro; and Koiso, Nagatugu, 4,288,283, Cl. 156-643.000.

Kaneko, Katsumi: *See—*
Sakakibara, Tadamori; Matsushima, Yoshihisa; Nagashima, Yukio; Okamoto, Nobukazu; Kaneko, Katsumi; Ishii, Yohio; and Wada, Shozo, 4,288,634, Cl. 568-454.000.

Kanisawa, Hideo; Kitahata, Tamio; and Horie, Hideo, to Konishiroku Photo Industry Co., Ltd. Process for preparing silver halide photographic emulsions. 4,288,535, Cl. 430-569.000.

Kanner, Gary L.: *See—*
Bilanceri, Silvio G.; Kanner, Gary L.; and Uffer, Michael B., 4,288,733, Cl. 320-2.000.

Kanzaka, Yoshihiro, to Yoshida Kogyo, K.K. Automatically locking slider for slide fastener. 4,287,646, Cl. 24-205.14R.

Kappus, Helmut: *See—*
Rodermund, Gerd; and Kappus, Helmut, 4,287,647, Cl. 28-147.000.

Karim, Khalid A.; and Rea, James H., to Gulf Oil Corporation. Blends of ethylene-alkyl acrylate copolymers with certain polyesters. 4,288,572, Cl. 525-176.000.

Karim, Khalid A.; and Rea, James H., to Gulf Oil Corporation. Blends of low density ethylene polymers with certain polyesters. 4,288,573, Cl. 525-177.000.

Karkhanis, Yashwant D.; and Carlo, Dennis J., to Merck & Co., Inc. Antigenic complex from *N. gonorrhoeae*. 4,288,557, Cl. 435-272.000.

Karnofsky, George B.; and Slovski, John, to Dravo Corporation. Process for rectification of miscella from extraction of oleaginous seeds. 4,288,297, Cl. 203-81.000.

Karube, Isao: *See—*
Suzuki, Shuichi; and Karube, Isao, 4,288,544, Cl. 435-39.000.

Kasai, Tadao: *See—*
Yamamoto, Ryuji; Nakahara, Fukumori; and Kasai, Tadao, 4,288,823, Cl. 360-73.000.

Kashioka, Seiji; Shima, Yoshihiro; Miyatake, Takafumi; Ejiri, Masakazu; and Obata, Osamu, to Hitachi, Ltd. Compressed image producing system. 4,288,816, Cl. 358-138.000.

Kashiwagi, Masatoshi: *See—*
Tanaka, Mutsuhiro; and Kashiwagi, Masatoshi, 4,288,497, Cl. 428-447.000.

Kashiwagi, Takashi, to Process Shizai Co., Ltd. Recording material. 4,288,509, Cl. 430-5.000.

Kastner, Ralph E.: *See—*
Boeck, LaVerne D.; and Kastner, Ralph E., 4,288,549, Cl. 435-119.000.

Katada, Naota: *See—*
Imamura, Akio; and Katada, Naota, 4,287,802, Cl. 84-1.010.

Katagiri, Masayoshi; and Ogura, Osamu, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Brake booster. 4,287,811, Cl. 91-369.00A.

Katakura, Masayuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrically variable impedance circuit. 4,288,707, Cl. 307-264.000.

Kato, Hidetoshi: *See—*
Niimi, Masayoshi; Torii, Koshi; and Kato, Hidetoshi, 4,288,728, Cl. 318-139.000.

Kato, Taizo. Tool holder or spindle. 4,288,183, Cl. 408-142.000.

Kato, Takefumi; and Abe, Haruo, to Iwatsu Electric Co., Ltd. Method of erasing information in a scan converter storage tube. 4,288,720, Cl. 315-13.0ST.

Kato, Yoji: *See—*
Noguchi, Masaaki; Tanaka, Taro; and Kato, Yoji, 4,287,862, Cl. 123-310.000.

Katoh, Hirotada: *See—*
Hiromae, Yoshitaka; Nakamura, Kazuo; Wada, Toshiya; and Katoh, Hirotada, 4,288,492, Cl. 428-336.000.

Katou, Hisao; and Sakata, Yoshiya. Electrode type steam vaporizer. 4,288,684, Cl. 219-295.000.

Katsuma, Shinichi: *See—*
Saima, Tooru; Ohya, Isao; Imada, Takahiko; Sato, Hideo; and Katsuma, Shinichi, 4,288,290, Cl. 176-19.00R.

Kattenbroek, Hendrik J.; and Plug, Jan, to Moba H .ng Barneveld. Apparatus for consecutively discharging objects .om containers. 4,287,982, Cl. 198-706.000.

Kaugars, Eugene; and Ossola, George A., to Brunswick Corporation. Ultra light weight golf club shaft. 4,288,075, Cl. 273-80.00B.

Kawabata, Shigeo; and Inazaki, Norihisa, to Nippon Kokan Kabushiki Kaisha. Self-scanning apparatus having improved measuring range for measuring contour of a metallic body. 4,288,747, Cl. 324-207.000.

Kawada, Tousuke: *See—*
Asai, Koichi; and Kawada, Tousuke, 4,287,668, Cl. 29-838.000.

Kawaguchi, Kiyohiko: *See—*
Sakamoto, Yoshiyasu; Tamura, Yoichi; Kawaguchi, Kiyohiko; and Inada, Kiyotaka, 4,288,162, Cl. 356-335.000.

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Yamada, Shigeyasu; Kawamura, Kazumi; and Nakamura, Shuji, 4,288,714, Cl. 313-142.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Fujikawa, Tetsuzo; Takada, Toshiyuki; and Misawa, Kichiji, 4,287,860, Cl. 123-73.0PP.
Ito, Hayami; Nagai, Chiaki; Nakabayashi, Yasuyuki; Igarashi, Kihachiro; Mouri, Kunihiko; and Ikeda, Takashi, 4,288,420, Cl. 423-239.000.
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Hatano, Masashi; Hagiwara, Tatsuo; Mikamo, Masaaki; Ebihara, Yoshimasa; Tomura, Yasutomo; and Imai, Keiji, 4,288,166, Cl. 366-149.000.

Kawate, Kenji: *See—*
Sekiwa, Seiichiro; Kawate, Kenji; and Jinnouchi, Hidenobu, 4,288,258, Cl. 148-13.000.
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Kaye, Alan S., to United Kingdom Atomic Energy Authority. CO_2 Laser. 4,288,756, Cl. 331-94.50G.

Kaye, Robert M.; Eiloo, Gary A.; and Tucker, Thomas. Method for testing metal detectors. 4,288,748, Cl. 324-326.000.

Keathley, Bob N., to IXL Manufacturing Co., Inc. Tool handle and method of making same. 4,287,640, Cl. 16-110.00R.

Keefer, Bowie G. Rotary shaft driven reverse osmosis method and apparatus. 4,288,326, Cl. 210-637.000.

Keiper Dynavit GmbH & Co.: *See—*
Lautenschlager, Peter; and Teichmann, Michael, 4,287,894, Cl. 128-687.000.

Keith, Donald G.; and Flecknoe-Brown, Anthony, to ICI Australia Limited. Thermoplastic forming process. 4,288,401, Cl. 264-550.000.

Kellersohn, Rudolf: *See—*
Konrad, Klaus-Dieter; Kellersohn, Rudolf; Steck, Hans; and Schaub, Josef, 4,288,266, Cl. 156-158.000.

Kem-O-Kleen, Inc.: *See—*
Hewett, Charley L., 4,287,912, Cl. 137-516.270.

Kemeny, George A.; and Cookson, Alan H., to Westinghouse Electric Corp. Corrugated outer sheath gas-insulated transmission line. 4,288,652, Cl. 174-21.00C.

Kepco, Inc.: *See—*
Nercessian, Sarkis, 4,288,739, Cl. 323-275.000.

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Fedders, Heinrich; and Beckers, Willi, 4,288,409, Cl. 422-219.000.

Kerr-McGee Corporation: *See—*
Ingle, James E., 4,288,125, Cl. 299-30.000.

Kertz, Charles A., to Kertz, Susanna A. Steering wheel attachment. 4,287,621, Cl. 5-440.000.

Kertz, Susanna A.: *See—*
Kertz, Charles A., 4,287,621, Cl. 5-440.000.

Kettenes, Dirk K.: *See—*
Nieuwland, Kees N.; and Kettenes, Dirk K., 4,288,350, Cl. 252-522.00R.

Khanna, Pyare L.: *See—*
Singh, Prithipal; Khanna, Pyare L.; and Colvin, Floyd W., 4,288,553, Cl. 435-188.000.

Khlamenko, Albert S.: *See—*
Surzhenko, Evgeny M.; Basilaev, Bronislav F.; Molotkov, Roman V.; Madorsky, Alexandr S.; Shalun, Grigory B.; Golynkina, Valentina B.; Ershova, Margarita A.; Eliseeva, Irina P.; Trukhtenkova, Nina E.; Gurylev, Sergei M.; Kopetskaya, Diana L.; Pechko, Evgeny Y.; Khlamenko, Albert S.; and Magnitsky, Viktor V., 4,288,491, Cl. 428-332.000.

Khodyrev, Vladimir I.: *See—*
Selivanov, Anatoly G.; Yakovlev, Grigory P.; Khodyrev, Vladimir I.; and Zhivetin, Valery V., 4,287,674, Cl. 34-201.000.

Kieferle, Wolfgang; and Waschle, Franz. Process for forming a metal or alloy layer and device for executing same. 4,288,306, Cl. 204-192.00R.

Kielbania, Andrew J., Jr., to Rohm and Haas Company. Polymers adherent to polyolefins. 4,288,499, Cl. 428-518.000.

Kihlberg, Yngve R.: *See—*
Lagerquist, Sven G. R.; and Kihlberg, Yngve R., 4,287,938, Cl. 165-3.000.

Kikuchi, Hideo; Takaoka, Haruyoshi; and Baba, Shigenori, to Fujitsu Limited. Complementary metal-oxide semiconductor. 4,288,804, Cl. 357-42.000.

Kikuchi, Toshiaki: *See—*
Fujita, Toshihito; Kikuchi, Toshiaki; and Nakazawa, Koji, 4,287,799, Cl. 83-347.000.

Kilichowski, Kurt B.; Cukor, Peter; and Brecher, Charles, to GTE Laboratories Incorporated. Photoresist of polyvinyl alcohol and ferric dichromate. 4,288,513, Cl. 430-28.000.

Kim, Kyoung S.: *See—*
Johnson, Francis; and Kim, Kyoung S., 4,288,608, Cl. 560-53.000.

Kim, Tai K.: *See—*
Christini, James N.; Kim, Tai K.; and McClintic, Robert P., 4,288,216, Cl. 432-112.000.
Christini, James N.; Kim, Tai K.; and McClintic, Robert P., 4,288,217, Cl. 432-112.000.
MacInnis, Martin B.; and Kim, Tai K., 4,288,413, Cl. 423-54.000.

Kimura, Yoshio: *See—*
Misumi, Atsushi; and Kimura, Yoshio, 4,287,969, Cl. 188-134.000.

Kindell, Jerry L.; and Flynn, Richard T., to Honeywell Information Systems Inc. Apparatus for identification and removal of a sign signal character superimposed. 4,288,850, Cl. 364-200.000.

King-Seeley Thermos Co.: *See—*
Hoenisch, Walter H., 4,287,725, Cl. 62-344.000.

Kinoshita, Harumi; Hayashi, Yoshiaki; and Saito, Tadao, to Yoshino Kogyosho Co., Ltd. Parison and method for forming parisons for biaxial orientation blow molding. 4,288,478, Cl. 428-35.000.

Kirchmayr, Rudolf; Fussenegger, Werner; and Illy, Hugo, to Ciba-Geigy Corporation. Process for foaming plastics. 4,288,560, Cl. 521-90.000.

Kirincich, Joseph G.: *See—*
Cilderman, Janis J.; and Kirincich, Joseph G., 4,287,651, Cl. 29-159.00R.

Kirino, Osamu; Hashimoto, Shunichi; Matsumoto, Hiroshi; and Oshio, Hiromichi, to Sumitomo Chemical Company, Limited. N-Benzylhaloacetamide derivatives, and their production and use. 4,288,244, Cl. 71-118.000.

Kiriyama, Tsutomu: *See—*
Norota, Susumu; Kiriyama, Tsutomu; and Imoto, Tadasi, 4,288,484, Cl. 428-113.000.

Kirstine, Dale J.: *See—*
Clover, William M., Jr., 4,288,006, Cl. 222-42.000.

Kishimoto, Juji: *See—*
Sado, Ichiro; Kishimoto, Juji; and Murata, Hiroshi, 4,288,792, Cl. 340-756.000.

Kiss, Zoltan: *See—*
Bucsky, Gyorgy; Kiss, Zoltan; and Tatrai, Lajos, 4,287,757, Cl. 73-61.400.

Kitahata, Tamio: *See—*
Kanisawa, Hideo; Kitahata, Tamio; and Horie, Hideo, 4,288,535, Cl. 430-569.000.

Kiyama, Yosito; Tachibana, Shinichi; Yamashita, Riichiro; and Horino, Takeshi, to Mitsubishi Jukogyo Kabushiki Kaisha; and Matsushita Tsushin Kogyo Kabushiki Kaisha. Toll road terminal machine. 4,288,688, Cl. 235-384.000.

Klausbruckner, Gert; and Sieber, Konrad, to Steinbock GmbH. Arrangement for forming and handling collective loads. 4,288,193, Cl. 414-342.000.

Kleebaur, Karl: *See*—
Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; Kunz, Johann; Lemke, Werner; and Sohnle, Rudiger, 4,288,711, Cl. 310-68.00D.
Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; and Sohnle, Rudiger, 4,288,712, Cl. 310-91.000.

Klees, Garry, to Boeing Company, The. Supersonic jet engine and method of operating the same. 4,287,715, Cl. 60-204.000.

Klein, Gary S., to Veplex Corporation. Intermittent adhesive applicator. 4,287,846, Cl. 118-212.000.

Klein, Herbert H., to Unarco Industries, Inc. Wedgable storage rack. 4,287,994, Cl. 211-191.000.

Klein, Schanzlin & Becker AG: *See*—
Viertler, Albin, 4,288,204, Cl. 417-243.000.

Klepsch, Kristian, to Klepsch Kunst GmbH & Co. KG Galerie. Process and mould for the manufacture of multi-walled hollow bodies, especially of glass. 4,288,238, Cl. 65-23.000.

Klepsch Kunst GmbH & Co. KG Galerie: *See*—
Klepsch, Kristian, 4,288,238, Cl. 65-23.000.

Klie, Wolfgang: *See*—
Reidelbach, Willi; Renner, Hermann; and Klie, Wolfgang, 4,288,025, Cl. 228-173.00F.

Kling, Jane A. Doll with removable organs. 4,288,222, Cl. 434-272.000.

Klockner-Humboldt-Deutz AG: *See*—
Epper, Wolfgang; and Heckmann, Wolfgang, 4,288,029, Cl. 233-20.00A.
Herchenbach, Horst; Ramesohl, Hubert; and Fleischer, Joachim, 4,288,213, Cl. 432-14.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Zenker, Walter, 4,287,781, Cl. 74-375.000.

Klotz, Al. Artificial minnow bait with swinging keel weight. 4,287,679, Cl. 43-42.090.

Knaack, Howard L.; and Weger, Kenneth F., Jr., to Knaack Manufacturing Company. Storage cabinet. 4,288,134, Cl. 312-290.000.

Knaack Manufacturing Company: *See*—
Knaack, Howard L.; and Weger, Kenneth F., Jr., 4,288,134, Cl. 312-290.000.

Knecht Filterwerke GmbH: *See*—
Frey, Gunter, 4,287,917, Cl. 138-30.000.

Knetzger, Robert C., to Mattel, Inc. Electronic game. 4,288,537, Cl. 434-169.000.

Knight, Allan R.; and Mathur, Indresh. Membrane support assembly for electrolytic cell and method of making same. 4,288,310, Cl. 204-252.000.

Knowles, Albert: *See*—
Rines, Robert H.; and Knowles, Albert, 4,287,852, Cl. 119-3.000.

Kobayashi, Masatoshi; Shimakawa, George; Hara, Yukio; and Fujii, Hiroyuki, to Matsushima Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Suwa Seikosha. Method of producing housing element for quartz crystal oscillator. 4,288,284, Cl. 156-651.000.

Kobayashi, Takehiro: *See*—
Morimoto, Yoshinori; and Kobayashi, Takehiro, 4,288,046, Cl. 242-84.21R.

Kobylinski, Thaddeus P.: *See*—
Beach, David L.; and Kobylinski, Thaddeus P., 4,288,648, Cl. 585-523.000.

Koch, Gene C., to Timex Corporation. Electro-optical composition of the guest-host type. 4,288,147, Cl. 350-349.000.

Koch, Klaus, to Hermann Berstorff Maschinenbau GmbH. Coal hydrogenation apparatus having means for monitoring and controlling hydrogenation pressure. 4,288,405, Cl. 422-111.000.

Koch, Robert L., II, to George Koch Sons, Inc. Method of curing coated articles. 4,287,671, Cl. 34-23.000.

Kodaka, Takayuki: *See*—
Yoshida, Takashi; Matsuyama, Takeshi; Kuki, Tamaki; and Kodaka, Takayuki, 4,288,800, Cl. 357-22.000.

Kodama, Yutaka: *See*—
Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,288,797, Cl. 346-75.000.

Koepke, Gunther: *See*—
Meyer, Rudolf; Koepke, Gunther; and Hourticolon, Roland, 4,288,469, Cl. 427-57.000.

Kohler, Henry A., to Truly Magic Products, Inc. Roller construction for paper feeding. 4,287,649, Cl. 29-130.000.

Kohn, Gustave K.; and Baer, Ted A., to Zoecon Corporation. Substituted 2,2-dimethylcyclopropaneamides. 4,288,621, Cl. 564-190.000.

Koiso, Nagatugu: *See*—
Umezaki, Hiroshi; Nishida, Hideki; Tsumita, Norikazu; Yamada, Hirozi; Kaneko, Katsuhiro; and Koiso, Nagatugu, 4,288,283, Cl. 156-643.000.

Kojima, Hiroshi; Ito, Kunio; Akiyama, Masami; and Tanaka, Takeshi, to Konishiroku Photo Industry Co., Ltd. Process for the production of photosensitive plates for printing. 4,288,521, Cl. 430-169.000.

Kokubo, Eiichi; and Sugai, Takatoshi, to Laurel Bank Machine Co., Ltd. Coin discharge machine. 4,287,900, Cl. 133-4.00A.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Nakai, Taiichiro; Furusawa, Kahei; Nunokawa, Makoto; and Ejiri, Yoshihiro, 4,288,144, Cl. 350-96.230.

Koller, Manfred: *See*—
Eusemann, Robert; Handke, Gunther; and Koller, Manfred, 4,287,970, Cl. 188-269.000.

Kollonitsch, Janos; and Marburg, Stephen, to Merck & Co., Inc. Fluorination process. 4,288,601, Cl. 548-344.000.

Kolodzey, James S.; Noel, Francis E., Jr.; and Stilwell, George R., Jr., to International Business Machines Corp. Half-duplex/simplex digital signal converter. 4,288,869, Cl. 370-31.000.

Komamiya, Kogaku; and Suzuki, Hajime. Checking paper for sheet combustion type oxygen concentration measuring instrument. 4,288,403, Cl. 422-83.000.

Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH: *See*—
Veigel, Helmut, 4,288,184, Cl. 408-185.000.

Konesky, Leo L. Hair comb. 4,287,898, Cl. 132-11.00R.

Konishikawa, Kaoru; Sasaki, Shunsuke; Higuchi, Kouichi; and Hirose, Fuminori, to Matsushita Electric Industrial Co., Ltd. Printed circuit board. 4,288,840, Cl. 361-410.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kanisawa, Hideo; Kitahata, Tamio; and Horie, Hideo, 4,288,535, Cl. 430-569.000.
Kojima, Hiroshi; Ito, Kunio; Akiyama, Masami; and Tanaka, Takeshi, 4,288,521, Cl. 430-169.000.
Okamoto, Syuzi; and Mukai, Naoto, 4,287,984, Cl. 198-847.000.

Konrad, Klaus-Dieter; Kellersohn, Rudolf; Steck, Hans; and Schaub, Josef, to Ruhrchemie Aktiengesellschaft. Method for heated tool butt welding of tube and pipe of thermoplastic materials. 4,288,266, Cl. 156-158.000.

Kopetskaya, Diana L.: *See*—
Surzhenko, Evgeny M.; Basilaev, Bronislav F.; Molotkov, Roman V.; Madorsky, Alexandr S.; Shalun, Grigory B.; Golynkina, Valentina B.; Ershova, Margarita A.; Eliseeva, Irina P.; Trukhtenkova, Nina E.; Gurylev, Sergei M.; Kopetskaya, Diana L.; Pechko, Evgeny Y.; Khlamenko, Albert S.; and Magnitsky, Viktor V., 4,288,491, Cl. 428-332.000.

Korf-Stahl AG: *See*—
Elsner, Emil; and Heinen, Leo, 4,287,933, Cl. 164-452.000.

Koshimaru, Hajime; and Ishii, Shohju, to Nissan Motor Co., Ltd. Process of closed extrusion shaping of a metal rod material and an apparatus therefor. 4,287,747, Cl. 72-358.000.

Kostylev, Anatoly A.: *See*—
Ljublinsky, Efim Y.; Smirnov, Viktor A.; and Kostylev, Anatoly A., 4,287,936, Cl. 164-329.000.

Kottek, Dagmar: *See*—
Bier, Gerhard; Kottek, Dagmar; Petersen, Egon N.; Richtzenhain, Hermann; and Vollkommer, Norbert, 4,288,607, Cl. 560-11.000.

Kotthaus, Erich; and Spiess, Hans J., to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Clamping apparatus for clamping cutter blades of a gear cutting machine at a grinding machine. 4,287,686, Cl. 51-225.000.

Kottke, Joachim, to Andreas Stihl. Mount for a holding structure of a free-cutting device. 4,288,171, Cl. 403-218.000.

Koulbanis, Constantin; Bouillon, Claude; and Darmenton, Patrick, to L'Oreal. Cosmetic compositions having a slimming action. 4,288,433, Cl. 424-232.000.

Kramer, Michael J.; and Tilley, Jefferson W., to Hoffman-La Roche Inc. Antiviral 1-adamantyl-3-(phenylsulfonyl)thioureas. 4,288,454, Cl. 424-321.000.

Kramer, Morton: *See*—
Craft, Donald I.; and Kramer, Morton, 4,288,561, Cl. 521-90.000.

Kramer, Stanley: *See*—
Ciliberto, Paul; and Kramer, Stanley, 4,288,460, Cl. 426-96.000.

Kramer, Stephen D.: *See*—
Swainson, Wyn K.; and Kramer, Stephen D., 4,288,861, Cl. 365-127.000.

Kraus, Georg: *See*—
Hinkel, Holger; and Kraus, Georg, 4,288,716, Cl. 313-230.000.

Krause, William F.; and Turner, Edwin C., to Hydril Company. Subsurface safety valve. 4,287,954, Cl. 166-322.000.

Kreft, Wolfgang, to Volkswagenwerk Aktiengesellschaft. Accelerometer and evaluation circuit. 4,287,765, Cl. 73-517.00R.

Kreissig, Ernst; and Steinmann, Friedrich, to Schweizerische Lokomotive-und Maschinenfabrik. Transversely torsionally interconnected railway vehicle trucks. 4,287,832, Cl. 105-176.000.

Krejci, Wayne, to Coin Acceptors, Inc. Clutch assembly for vending control system. 4,287,974, Cl. 192-56.00R.

Kresta, Jiri; and Shen, Chen S., to Dow Chemical Co., The. Initiators for isocyanate reactions. 4,288,562, Cl. 521-121.000.

Kretz, Carl, to Kretztechnik Gesellschaft m.b.H. Ultrasonic section surface examination equipment. 4,287,767, Cl. 73-625.000.

Kretztechnik Gesellschaft m.b.H.: *See*—
Kretz, Carl, 4,287,767, Cl. 73-625.000.

Kreuder, Hans J.: *See*—
Rottmaier, Ludwig; Merten, Rudolf; Dhein, Rolf; and Kreuder, Hans J., 4,288,569, Cl. 525-113.000.

Krishan, Baldev, to Anderson Jacobson, Inc. Interface circuitry for acoustic coupler compensation. 4,288,661, Cl. 179-2.00C.

Krob, Erwin; and Svoboda, Josef, to TMC Corporation. Sole-support mechanism for the sole of a ski boot. 4,288,093, Cl. 280-605.000.

Kropp, James E., to Minnesota Mining and Manufacturing Company. Water-activatable crosslinked adhesive and energy control film made therewith. 4,288,493, Cl. 428-350.000.

Kruger, Heinrich; and Tack, Hans, to Fried. Krupp GmbH. Cutting tool bit. 4,288,179, Cl. 407-114.000.

Kruger, James B., to Bangor Punta Corporation. Handcuffs. 4,287,731, Cl. 70-16.000.

Kubach, Elizabeth V.: *See*—
Kubach, John S.; and Kubach, Elizabeth V., 4,287,794, Cl. 81-3.310.

Kubach, John S.; and Kubach, Elizabeth V. Container opening tool. 4,287,794, Cl. 81-3.310.

Kubicek, Donald H., to Phillips Petroleum Company. Oxidation of thiols employing cobalt molybdate/triethylamine catalyst. 4,288,627, Cl. 568-26.000.

Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, to Yamanouchi Pharmaceutical Co., Ltd. Nitrogen-containing heterocyclic ring derivatives and analgesic and anti-inflammatory compositions and methods employing them. 4,288,438, Cl. 424-251.000.

Kubo, Shinji; and Yamada, Norio, to Chibayaku Groceries, Incorporated. Method and equipment to measure fat content of meat. 4,287,760, Cl. 73-149.000.

Kubodera, Seiiti: *See*—
Seoka, Yoshio; Aoki, Kozo; Yokota, Yukio; and Kubodera, Seiiti, 4,288,532, Cl. 430-385.000.

Kuchuk-Yatsenko, Sergei I.; Chernenko, Ivan A.; Bogorsky, Mikhail V.; Kulesh, Alexandr I.; Cherednichok, Vitaly T.; and Tishura, Vladimir I. Method of continuous flash butt welding and hydraulic drive of continuous flash butt-welding machine for realization of this method. 4,288,676, Cl. 219-100.000.

Kudernatsch, Gunter: *See*—
Fried, Reinhard; and Kudernatsch, Gunter, 4,288,203, Cl. 417-64.000.

Kudo, Yoshihiko; and Hagiwara, Hiroshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process of treating exhaust gas containing nitrogen oxides and sulfur dioxide. 4,288,421, Cl. 423-395.000.

Kugel, Christoph: *See*—
Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; Kunz, Johann; Lemke, Werner; and Sohnle, Rudiger, 4,288,711, Cl. 310-68.00D.
Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; and Sohnle, Rudiger, 4,288,712, Cl. 310-91.000.

Kuhlmann, Dennis: *See*—
Egli, Werner H.; Kuhlmann, Dennis; and Wier, Jack E., 4,287,809, Cl. 89-41.0EA.

Kuhner, Albert: *See*—
Brackmann, Warren A.; and Kuhner, Albert, 4,287,897, Cl. 131-303.000.

Kuki, Tamaki: *See*—
Yoshida, Takashi; Matsuyama, Takeshi; Kuki, Tamaki; and Kodaka. Takayuki, 4,288,800, Cl. 357-22.000.

Kulesh, Alexandr I.: *See*—
Kuchuk-Yatsenko, Sergei I.; Chernenko, Ivan A.; Bogorsky, Mikhail V.; Kulesh, Alexandr I.; Cherednichok, Vitaly T.; and Tishura, Vladimir I., 4,288,676, Cl. 219-100.000.

Kulhanek, James A., to Towmotor Corporation. Apparatus for moving a member. 4,287,787, Cl. 74-493.000.

Kumar, Arun, to Rockwell International Corporation. Method of increasing the fatigue life of titanium alloy parts. 4,287,740, Cl. 72-40.000.

Kuniyoshi, Yasunobu: *See*—
Okada, Takashi; and Kuniyoshi, Yasunobu, 4,288,754, Cl. 330-260.000.

Kuntner, Richard J.; and Vander Meer, James C., to Eaton Corporation. Protection system for electric motors. 4,288,828, Cl. 361-31.000.

Kunz, Johann: *See*—
Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; Kunz, Johann; Lemke, Werner; and Sohnle, Rudiger, 4,288,711, Cl. 310-68.00D.

Kuo, Tsai-Shu: *See*—
Chang, Sir-Sea; Chern, Sheng-Laang; Ting, Gann; and Kuo, Tsai-Shu, 4,288,412, Cl. 423-10.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, 4,288,251, Cl. 501-105.000.
Hisazumi, Nobuyuki; Yamamoto, Masataka; and Uehara, Tsutomu, 4,288,488, Cl. 428-214.000.
Kudo, Yoshihiko; and Hagiwara, Hiroshi, 4,288,421, Cl. 423-395.000.
Yoshikumi, Chikao; Wada, Toshihiko; Makita, Himromitsu; and Suzuki, Kinzaburo, 4,288,555, Cl. 435-254.000.

Kurick, James F., to Libbey-Owens-Ford Company. Glass sheet shipping packages. 4,287,990, Cl. 206-448.000.

Kurinko, Carl D.: *See*—
Hardin, Roy T., Jr.; and Kurinko, Carl D., 4,288,292, Cl. 176-87.000.

Kuroda, Nobuyuki: *See*—
Miyoshi, Mitsuji; Tajima, Yoshio; Matsuura, Kazuo; Kuroda, Nobuyuki; and Matsuno, Mitsuo, 4,288,579, Cl. 526-124.000.

Kuroda, Takao: *See*—
Kajimura, Takashi; Hirao, Motohisa; Nakamura, Michiharu; Kuroda, Takao; Yamashita, Shigeo; and Umeda, Jun-Ichi, 4,288,757, Cl. 331-94.50H.

Kurt Manufacturing Company, Inc.: *See*—
Lenz, John O., 4,288,185, Cl. 409-121.000.

Kusama, You: *See*—
Miyama, Masao; and Kusama, You, 4,288,287, Cl. 162-135.000.

Kushner, Gregory A.; and Martinic, Jack, to Bendix Corporation, The. Valve assembly having a predetermined shear line. 4,287,904, Cl. 137-68.00R.

Kusmierz, Hans: *See*—
Mayr, Ulrich; Horeth, Dietmar; and Kusmierz, Hans, 4,288,168, Cl. 400-322.000.

Kusters, Eduard. Belt arrangement and press equipped therewith for the continuous manufacture of wood chipboard and similar materials. 4,288,208, Cl. 425-371.000.

Kusumi, Takenori; and Nakanishi, Koji, to Suntory Limited. Therapeutic compositions containing 4-nitroisoxazole. 4,288,445, Cl. 424-272.000.

Kusunoki, Katsuo: *See*—
Kutsuwada, Noboru; Saito, Minoru; Namiki, Ryoichi; and Kusunoki, Katsuo, 4,288,514, Cl. 430-54.000.

Kutsuwada, Noboru; Saito, Minoru; Namiki, Ryoichi; and Kusunoki, Katsuo, to Canon Kabushiki Kaisha. Method for controlling image formation in electrophotography by pre-exposure step. 4,288,514, Cl. 430-54.000.

Kuwakado, Satosi: *See*—
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; Shimogawa, Toshiaki; and Chiba, Seiichi, 4,288,098, Cl. 280-806.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Suzuki, Shuichi; and Karube, Isao, 4,288,544, Cl. 435-39.000.

Kyrias, George M. Cost-effective solar heating system. 4,287,883, Cl. 126-445.000.

L. A. Daly Company: *See*—
Guth, Eugene D.; Daly, LeGrand A.; and Arand, John K., 4,288,408, Cl. 422-193.000.

L. & C. Steinmuller GmbH: *See*—
Becker, Jorgen, 4,287,944, Cl. 165-158.000.

Laboratorios Made, S.A.: *See*—
Brana, Miguel F.; Lopez Rodriguez, Maria L.; Castellano Berlanga, Jose M.; Soto Camara, Jose L.; and Martinez Roldan, Cristobal, 4,288,597, Cl. 546-265.000.

Lagerquist, Sven G. R.; and Kihlberg, Yngve R. Method for exchanging heat and a device for carrying out said method. 4,287,938, Cl. 165-3.000.

Laggan, James J.: *See*—
Rogers, Wesley A.; and Laggan, James J., 4,288,788, Cl. 340-378.200.

Laidler, Dale A.: *See*—
Crosby, John; Holland, David; Laidler, Dale A.; and Milner, David J., 4,288,387, Cl. 260-465.00D.

LaJet Energy Company: *See*—
Johnson, Alfred L., Jr.; and Peckham, Victor A., 4,288,146, Cl. 350-295.000.

Landau, Ronald W. Strong focusing megatron. 4,288,289, Cl. 176-3.000.

Lane, Emma J. Bed cover holder and serving tray combination. 4,287,622, Cl. 5-505.000.

Langner, Fred R. Chute return mechanism for a photocopier collator. 4,288,070, Cl. 271-296.000.

Lanier, Jerry W., to Southwire Company. Cable end sealing method. 4,288,471, Cl. 427-120.000.

Lankston, Robert J., to Gulf & Western Manufacturing Company. Closure arrangement for pressure device. 4,288,001, Cl. 220-316.000.

Lanneau, Jacques: *See*—
Delcoigne, Adrien; and Lanneau, Jacques, 4,288,263, Cl. 156-42.000.

LaPorte Industries Limited: *See*—
Robinson, Michael, 4,288,650, Cl. 13-2.00P.

Laporte, Jean C.; and Laporte, Jean M., to S.A.R.L. Laporte Cibelec. Apparatus for target practice. 4,288,080, Cl. 273-406.000.

Laporte, Jean M.: *See*—
Laporte, Jean C.; and Laporte, Jean M., 4,288,080, Cl. 273-406.000.

La Rocca, Aldo V., to Fiat Auto S.p.A. Apparatus for treating metal workpieces with laser radiation. 4,288,678, Cl. 219-121.0LE.

La Rocca, Aldo V., to Fiat Auto S.p.A. Method of microdrilling metal workpieces using a power laser. 4,288,679, Cl. 219-121.0LL.

Larock, Richard C., to Iowa State University Research Foundation, Inc. Cyclopentanone synthesis. 4,288,613, Cl. 560-231.000.

Larrison, John E., to Orthodyne Electronics. Parts storage and handling system. 4,288,023, Cl. 228-110.000.

LaSalle Machine Tool, Inc.: *See*—
Vandenkieboom, John; and Myers, Douglas, 4,288,182, Cl. 408-129.000.

Lass, John L., to Square D Company. Cable lock assembly for outlet box. 4,288,655, Cl. 174-65.00R.

Laughlin, Gordon J., to United States of America, Navy. Wideband 180° hybrid junctions. 4,288,762, Cl. 333-117.000.

Laurel Bank Machine Co., Ltd.: *See*—
Kokubo, Eiichi; and Sugai, Takatoshi, 4,287,900, Cl. 133-4.00A.

Lautenschlager, Peter; and Teichmann, Michael, to Keiper Dynavit GmbH & Co. Apparatus for producing a series of impulses corresponding to a succession of pulse beats. 4,287,894, Cl. 128-687.000.

Lavallee, Pierre A.; and Stoffel, James C., to Xerox Corporation. Multi-resolution image signal processing apparatus and method. 4,288,821, Cl. 358-293.000.

Laws, Awbrey C. System for groundwater flow control. 4,288,174, Cl. 405-43.000.

Le Grand S.A.: *See*—
Durand, Guy, 4,287,644, Cl. 24-16.0PB.

Leach, Jack, to Burlington Industries, Inc. Ballistic vests. 4,287,607, Cl. 2-2.500.

Leandris, Sergio, to Precision Mecanique Labinal. Device for fitting the ends of electrical conductors or similar elements into a box. 4,287,665, Cl. 29-705.000.

Leather, Russell A., to Ferranti Limited. Insulation displacement contact for an electrical connector. 4,288,141, Cl. 339-97.00R.

Le Berre, Serge: *See*—
Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, 4,288,822, Cl. 358-296.000.

Leclerc, Pierre: *See*—
Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, 4,288,822, Cl. 358-296.000.

Ledig, Kurt W., deceased; and by Howes, David R., executor, to American Home Products Corporation. 7-(Substituted)-7H-pyrrolo[3,2-f]quinazoline-1,3-diamines. 4,288,595, Cl. 544-250.000.

Ledniczki, Ferenc; and Patak, Richard J., to Touch Activated Switch Arrays, Inc. Touch sensing keyboard construction. 4,288,786, Cl. 340-365.00S.

Lee, Chen Yi; Wu, Charles Tung-ming; Brooks, Mark A.; and Fallis, Robert E., to Bendix Corporation, The. Pressure sensor. 4,288,835, Cl. 361-283.000.

Lee, Martin J.; and Ornstein, Leonard, to Technicon Instruments Corporation. Method and apparatuses for electrophoretic immunoassay. 4,288,425, Cl. 424-1.000.

Lee, Patrick S., to Sperry Corporation. Average value tachometer for a disc drive servo and the like. 4,288,731, Cl. 318-618.000.

Lee, Wen-Fong. Automatic magnetic switch. 4,288,767, Cl. 335-6.000.

Lefaucheur, Claude: *See—*
Deck, Alphonse; and Lefaucheur, Claude, 4,287,924, Cl. 152-153.000.

Leibenzeder, Siegfried; and Heindl, Christine, to Siemens Aktiengesellschaft. Apparatus for the manufacture of epitaxial $Ga_{1-x}Al_xAs$:Si film. 4,287,848, Cl. 118-401.000.

Leiber, Heinz; Jonner, Wolf-Dieter; and Goebels, Hermann-Josef, to Robert Bosch GmbH. Anti-lock control system. 4,288,127, Cl. 303-111.000.

Leifeld, Ferdinand, to Trutzschler GmbH & Co. Carding element. 4,287,643, Cl. 19-114.000.

Lemahieu, Raymond G.; Depoorter, Henri; and Hofman, Emiel A., to Agfa-Gevaert, N.V. Photographic silver halide materials containing light-absorbing dyes. 4,288,534, Cl. 430-522.000.

Lemelson, Jerome H. Apparatus and method for controlling the internal structure of matter. 4,288,398, Cl. 264-23.000.

Lemelson, Jerome H.; and Grund, Christian. Automatic vehicle identification system and method. 4,288,689, Cl. 235-435.000.

Le Mer, Gerard. Metal cupboard. 4,288,136, Cl. 312-297.000.

Lemke, Werner: *See—*
Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; Kunz, Johann; Lemke, Werner; and Sohnle, Rudiger, 4,288,711, Cl. 310-68.00D.

Lemkey, Franklin D.: *See—*
Pearson, David D.; and Lemkey, Franklin D., 4,288,259, Cl. 148-32.000.

Lemonon, Claire: *See—*
Tinet, Claude; and Lemonon, Claire, 4,288,510, Cl. 430-11.000.

Lenke, Dieter: *See—*
Bliesener, Jens-Uwe; Geiss, Karl-Heinz; Lenke, Dieter; and Mueller, Claus D., 4,288,449, Cl. 424-274.000.

Lennox, William M.; and Lin, Hank S., to Microdyne Corporation. Demodulator for frequency modulated signals. 4,288,876, Cl. 455-214.000.

Lenz, John O., to Kurt Manufacturing Company, Inc. Outboard tracing station for carving machine. 4,288,185, Cl. 409-121.000.

Leodolter, Walter, to McDonnell Douglas Corporation. Tooling for superplastic forming diffusion bonding processes. 4,288,021, Cl. 228-15.100.

Leonard, Ian C. A.; and Jones, Barry E., to National Research Development Corp. Drive mechanism. 4,287,808, Cl. 87-44.000.

Leonard, Murray; and Jugl, Herbert F., to Vernitron Corporation. Gas collector/igniter for grills. 4,288,210, Cl. 431-263.000.

Leopold Kostal, Firma: *See—*
Berginski, Werner, 4,287,786, Cl. 74-492.000.

Lettera Arabica S.a.r.l.: *See—*
Aoun, Joseph, 4,287,677, Cl. 40-595.000.

Lettner, Kurt; Egger, Eugen; and Unger, Rudolf, to Steyr-Daimler-Puch Aktiengesellschaft. Reciprocating internal-combustion engine. 4,287,861, Cl. 123-198.00E.

Leupold, Ernst I.: *See—*
Schmidt, Hans-Joachim; Wunder, Friedrich; Arpe, Hans-Jurgen; and Leupold, Ernst I., 4,288,558, Cl. 518-716.000.

Leutgob, Alois: *See—*
Hojas, Hans; Leutgob, Alois; and Gsottbauer, Johann, 4,287,738, Cl. 72-20.000.

Lever Brothers Company: *See—*
Hooper, David C.; Johnson, George A.; and Peter, Donald, 4,288,341, Cl. 252-107.000.

Levitsky, Emmanuil A.: *See—*
Rabinovich, Georgy L.; Maslyansky, Gdal N.; Birjukova, Ljubov M.; Levitsky, Emmanuil A.; Volkova, Kira L.; Lukina, Zoya P.; and Mozhaiko, Viktor N., 4,288,347, Cl. 252-439.000.

Lewis, Kenneth W.; and Shaffer, Robert C., to Hitco. Elastomers containing chemically bonded metal atoms. 4,288,568, Cl. 525-111.000.

Lewis, Robert A.; and Honnen, Lewis R., to Chevron Research Company. Deposit control additives. 4,288,612, Cl. 560-159.000.

Libbey-Owens-Ford Company: *See—*
Kurick, James F., 4,287,990, Cl. 206-448.000.

Liborius, Erik: *See—*
de Ruvo, Alfonso; Norman, Bo; Duffy, Geoffrey G.; Moller, Klaus; Hansen, Karl E.; Felsvang, Karsten S.; and Liborius, Erik, 4,288,317, Cl. 209-139.00A.

Licari, Vito. Adjustable rack for hanging articles. 4,287,993, Cl. 211-105.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Nutz, Karl-Diether; and Moser, Helmut, 4,288,740, Cl. 323-303.000.

Lieberman, Samuel, to Shann, Thomas P. Water tap filter. 4,288,325, Cl. 210-449.000.

Lifehaus Corporation of Texas: *See—*
Hofler, Alois, 4,287,695, Cl. 52-241.000.

Lin, Hank S.: *See—*
Lennox, William M.; and Lin, Hank S., 4,288,876, Cl. 455-214.000.

Linde AG: *See—*
Gobl, Horst, 4,288,002, Cl. 220-438.000.

Lindsey, Harold A.: *See—*
Dockal, Rodney O.; and Lindsey, Harold A., 4,288,186, Cl. 409-175.000.

Lindsey, Hiram E., Jr., to MWL Tool and Supply Company. Setting tools and liner hanger assembly. 4,287,949, Cl. 166-212.000.

Ling, Alexander C.: *See—*
McDonald, John C.; Baichtal, James R.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig P., 4,288,870, Cl. 370-56.000.

Linguenheld, Louis: *See—*
Soula, Gerard; and Linguenheld, Louis, 4,288,386, Cl. 260-465.00F.

Linseth, Gerald S. Livestock feedlot management method and apparatus. 4,288,856, Cl. 364-567.000.

Lint, James D.: *See—*
Marzec, Willy; and Lint, James D., 4,288,041, Cl. 242-4.00R.

Litton Systems, Inc.: *See—*
Wilson, Albert, 4,288,320, Cl. 209-382.000.

Livesay, Richard E.; and Wright, Paul L., to Caterpillar Tractor Co. Keeper assembly. 4,288,172, Cl. 403-317.000.

Ljublinsky, Efim Y.; Smirnov, Viktor A.; and Kostylev, Anatoly A. Ingot casting apparatus. 4,287,936, Cl. 164-329.000.

Lockheed Corporation: *See—*
Fortescue, George H., 4,288,161, Cl. 356-73.000.

Lodder, Bernhard: *See—*
Hansen, Finn; and Lodder, Bernhard, 4,287,854, Cl. 119-17.000.

Lodzinski, Fred P., to Nekoosa Papers Inc. Optical property measurement system and method. 4,288,160, Cl. 356-73.000.

Loew, Peter; and Zink, Rudolf, to Ciba-Geigy Corporation. Cationic dyes. 4,288,589, Cl. 542-466.000.

Logic Devices, Inc.: *See—*
Allen, Paul E., 4,287,941, Cl. 165-70.000.

Lohse, Friedrich; Gutekunst, Ferdinand; Schmid, Rolf; and Schmitter, Andre, to Ciba-Geigy Corporation. Storable, solid mixture for the preparation of plastics which are based on epoxide resin and are stable to hydrolysis, the use of this mixture for the preparation of such plastics and plastics obtained in this way. 4,288,565, Cl. 521-135.000.

Lomakin, Alexandr M.: *See—*
Redikultsev, Jury V.; Gorbunov, Oleg P.; and Lomakin, Alexandr M., 4,288,404, Cl. 422-107.000.

Long, William E., to Ciba-Geigy AG. Pyridine-2,3,6-triones. 4,288,598, Cl. 546-288.000.

Longhenry, David K.: *See—*
Sielaff, Bruce H.; Praglin, Julius; McKie, James E., Jr.; Longhenry, David K.; Curtiss, Alan C.; and Bidwell, Charles B., 4,288,543, Cl. 435-34.000.

Longoni, Angelo: *See—*
Gozzo, Franco; Paolucci, Paride; and Longoni, Angelo, 4,288,611, Cl. 560-133.000.

Lonnstedt, Bo G. Fastening means for fitting an accessory, especially an ear muff, to a safety helmet. 4,287,614, Cl. 2-423.000.

Lopez, Efrain: *See—*
Hineborg, James R.; and Lopez, Efrain, 4,287,648, Cl. 29-79.000.

Lopez Rodriguez, Maria L.: *See—*
Brana, Miguel F.; Lopez Rodriguez, Maria L.; Castellano Berlanga, Jose M.; Soto Camara, Jose L.; and Martinez Roldan, Cristobal, 4,288,597, Cl. 546-265.000.

L'Oreal: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,288,622, Cl. 564-194.000.
Koulbanis, Constantin; Bouillon, Claude; and Darmenton, Patrick, 4,288,433, Cl. 424-232.000.

Lorenzen, Heinz-Christen: *See—*
Heitmann, Uwe; Lorenzen, Heinz-Christen; Wahle, Gunter; and Dahlgrun, Rolf, 4,287,754, Cl. 73-38.000.

Loring, Robert M.: *See—*
Conover, Steven M.; Loring, Robert M.; Ludwico, William A.; Arnold, John W.; and Ferber, George, 4,288,564, Cl. 521-122.000.

Lotscher, Bernhard, to Rotovolumetric AG. Apparatus containing a cylinder with a displaceable piston therein and a measuring transducer arranged essentially within the cylinder. 4,288,793, Cl. 340-870.370.

Louderback, Allan L., to Beckman Instruments, Inc. Method for increasing shelf-life of a serum bilirubin reference composition and composition produced thereby. 4,288,343, Cl. 252-408.000.

Louwenaar, David W. Solar shield. 4,287,683, Cl. 49-463.000.

Lowry, Joseph M.; and Griffin, Ernest E. Carriage for a grass trimming device. 4,287,709, Cl. 56-16.900.

Lowther, Lou Y. Auxiliary flotation gear for fishing boats. 4,287,624, Cl. 9-1.100.

Lucas, James M.; Perricone, Alphonse C.; and Enright, Dorothy P., to Milchem Incorporated. Aqueous drilling fluid additive, composition and process. 4,288,582, Cl. 526-240.000.

Ludwico, William A.: *See—*
Conover, Steven M.; Loring, Robert M.; Ludwico, William A.; Arnold, John W.; and Ferber, George, 4,288,564, Cl. 521-122.000.

Lugo, Julio I. Game apparatus. 4,288,078, Cl. 273-264.000.

Luik, Manfred. Parking aid. 4,288,777, Cl. 340-51.000.

Luker, Charles E.; and Gach, Peter P., to Sunbeam Plastics Corporation. Child-resistant lid for a pail. 4,288,000, Cl. 220-281.000.
Lukina, Zoya P.: *See*—
Rabinovich, Georgy L.; Maslyansky, Gdal N.; Birjukova, Ljubov M.; Levitsky, Emmanuil A.; Volkova, Kira L.; Lukina, Zoya P.; and Mozhaiko, Viktor N., 4,288,347, Cl. 252-439.000.
Lummus Company, The: *See*—
Cox, Robert P.; and Tarradellas, Norbert R., 4,288,234, Cl. 55-48.000.
Lundberg, Robert D.: *See*—
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Lundstrom, Linda. Adjustable garment. 4,287,611, Cl. 2-237.000.
Lunel, Jean: *See*—
Belloc, Andre; Florent, Jean; Lunel, Jean; Palla, Jean-Claude; and Mancy, Denise, 4,288,556, Cl. 435-265.000.
Lutz, Albert W.; and Diehl, Robert E., to American Cyanamid Co. 2,6-Dinitroaniline herbicides and use thereof. 4,288,385, Cl. 260-465.00E.
Lutzkendorf, Jorg: *See*—
Geiger, Michael; Schneider, Manfred; and Lutzkendorf, Jorg, 4,288,192, Cl. 414-223.000.
Lynch, Bobby R., to Tri-L Manufacturing, Inc. Hay bale handling mechanism. 4,288,191, Cl. 414-24.500.
Lynch, James E.: *See*—
Cobaugh, Robert F.; Lynch, James E.; and Taylor, Attalee S., 4,288,139, Cl. 339-74.00R.
Lynfield, H. Geoffrey: *See*—
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M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Vogt, Anton, 4,287,931, Cl. 164-7.200.
M.R.E. Enterprises, Inc.: *See*—
Rogers, Dan C.; and Maggio, Joseph A., 4,288,007, Cl. 222-66.000.
MacBeth, Ian H., to General Electric Company. Dielectric liquid impregnated with gases for use in transformers. 4,288,772, Cl. 336-58.000.
MacDonald, Paul M., to Babigian, Dickran. Drawer slide system. 4,288,137, Cl. 312-341.00R.
MacDonald, Robert D., to Masco Corporation. Self-closing hinge. 4,287,641, Cl. 16-139.000.
MacFarland, David R.: *See*—
Turley, Richard J.; and MacFarland, David R., 4,288,587, Cl. 528-57.000.
Machi, Sueo; Ishigaki, Isao; and Sugo, Takanobu, to Japan Atomic Energy Research Institute. Method of producing a membrane of graft copolymer. 4,288,467, Cl. 427-44.000.
Machlowitz, Roy A.: *See*—
McAleer, William J.; Markus, Henry Z.; and Machlowitz, Roy A., 4,288,539, Cl. 435-7.000.
MacInnis, Martin B.; and Kim, Tai K., to GTE Products Corporation. Separating molybdenum values from an aqueous solution containing tungsten by solvent extraction. 4,288,413, Cl. 423-54.000.
MacVicar, Douglas J.: *See*—
Garritsen, Petrus G. S.; MacVicar, Douglas J.; Young, Daniel P.; and Sojda, John G., 4,288,305, Cl. 204-112.000.
Madorsky, Alexandr S.: *See*—
Surzhenko, Evgeny M.; Basilaev, Bronislav F.; Molotkov, Roman V.; Madorsky, Alexandr S.; Shalun, Grigory B.; Golynkina, Valentina B.; Ershova, Margarita A.; Eliseeva, Irina P.; Trukhtenkova, Nina E.; Gurylev, Sergei M.; Kopetskaya, Diana L.; Pechko, Evgeny Y.; Khlamenko, Albert S.; and Magnitsky, Viktor V., 4,288,491, Cl. 428-332.000.
Magee, Walter L.; and Telschow, Jeffrey E., to Stauffer Chemical Company. Method for the production of tetraalkyl silicates. 4,288,604, Cl. 556-470.000.
Magers, Thomas A.; Sheats, John E.; and Tabb, David L., to Miles Laboratories, Inc. Ascorbate resistant composition, test device and method for detecting a component in a liquid test sample. 4,288,541, Cl. 435-14.000.
Maggio, Joseph A.: *See*—
Rogers, Dan C.; and Maggio, Joseph A., 4,288,007, Cl. 222-66.000.
Magnitsky, Viktor V.: *See*—
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Magyar Tudomanyos Akademia Muszaki Kemiai Kutato Intezet: *See*—
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Makita, Himromitsu: *See*—
Yoshikumi, Chikao; Wada, Toshihiko; Makita, Himromitsu; and Suzuki, Kinzaburo, 4,288,555, Cl. 435-254.000.
Makovec, Francesco: *See*—
Rovati, Luigi; Makovec, Francesco; and Senin, Paolo, 4,288,609, Cl. 560-117.000.
Malin, Richard A.: *See*—
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Malinowski, William J. Smoke detector and method. 4,288,791, Cl. 340-630.000.
Mallory, William R.: *See*—
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,288,365, Cl. 260-243.300.
Manabe, Takao; Ebata, Hitoshi; and Shin, Shouichi, to Toshiba Kikai Kabushiki Kaisha. Method of determining position of openings adapted to receive fret saw blade of numerically controlled fret saw machines. 4,288,851, Cl. 364-475.000.
Manassen, Joost: *See*—
Avigal, Yitzchak; Manassen, Joost; Hodes, Gary; and Cahen, David, 4,288,502, Cl. 429-111.000.
Mancy, Denise: *See*—
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Manini nee Gallichi, Anna. Circular knitting machines. 4,287,729, Cl. 66-149.00S.
Mansfield, Thomas L., to Reynolds Metals Company. Probes for the ultrasonic treatment or inspection of molten aluminum. 4,287,755, Cl. 73-61.00R.
Mar, Danny M., to Envirotech Corporation. Determination of total organic carbon in a plurality of aqueous samples containing halide ion. 4,288,229, Cl. 23-230.0PC.
Marathon Oil Company: *See*—
Sydansk, R. D.; and Gucwa, P. R., 4,287,951, Cl. 166-281.000.
Marburg, Stephen: *See*—
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Picquendar, Jean E.; Marchal, Michel; Dubois, Jean C.; and Duda, Eugene, 4,288,528, Cl. 430-297.000.
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Kushner, Gregory A.; and Martinic, Jack, 4,287,904, Cl. 137-68.00R.
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Deatherage, Robert L., 4,288,133, Cl. 312-279.000.

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Reese, Edmund A.; White, Lionel S., Jr.; and McAlexander, Joseph C., III, 4,288,706, Cl. 307-577.000.

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McCoy, David R.; and Naylor, Carter G., to Texaco Development Corporation. Process for secondary recovery of hydrocarbons. 4,288,334, Cl. 252-8.55D.

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Sombroek, Johannes; Becker, Karl-Heinz; Minck, Klaus O.; and Enenkel, Hans-Joachim, 4,288,452, Cl. 424-304.000.

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Hansen, Arne H., 4,288,114, Cl. 285-317.000.
Michael, Edgar E. Coal and ash caddy. 4,287,874, Cl. 126-242.000.
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Miles, Barry D. R., to Quantel Limited. Video picture processing including movement detection. 4,288,815, Cl. 358-105.000.
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Miska, Stanley R.; and Boyce, Jay E., to Schlegel Corporation. Weatherstrip with heat sealed substrate. 4,288,483, Cl. 428-92.000.
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Frees, Kenneth A., 4,287,966, Cl. 187-9.00R.
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Molins, Desmond W.; and Warner, Brian H., 4,287,979, Cl. 198-425.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, to Bayer Aktiengesellschaft. Pyrazol-5-ones. 4,288,446, Cl. 424-273.00P.
Moller, Klaus: *See*—
de Ruvo, Alfonso; Norman, Bo; Duffy, Geoffrey G.; Moller, Klaus; Hansen, Karl E.; Felsvang, Karsten S.; and Liborius, Erik, 4,288,317, Cl. 209-139.00A.
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Surzhenko, Evgeny M.; Basilaev, Bronislav F.; Molotkov, Roman V.; Madorsky, Alexandr S.; Shalun, Grigory B.; Golynkina, Valentina B.; Ershova, Margarita A.; Eliseeva, Irina P.; Trukhtenkova, Nina E.; Gurylev, Sergei M.; Kopetskaya, Diana L.; Pechko, Evgeny Y.; Khlamenko, Albert S.; and Magnitsky, Viktor V., 4,288,491, Cl. 428-332.000.
Monsanto Company: *See*—
Alt, Gerhard H.; and Chupp, John P., 4,288,242, Cl. 71-76.000.
Bromley, James E.; and Stutz, Frank, 4,287,713, Cl. 57-288.000.
Coran, Aubert Y.; and Patel, Raman, 4,288,570, Cl. 525-133.000.

Montedison S.p.A.: *See*—
Gozzo, Franco; Paolucci, Paride; and Longoni, Angelo, 4,288,611, Cl. 560-133.000.
Montferme, Daniel, to E. P. Remy et Cie. Device for distributing containers into several rows and machine using such a device. 4,287,980, Cl. 198-425.000.
Montgomery, John R., to Iron Removal Specialists, Inc. Use of specially prepared iron floc to oxidize and remove iron in water treatment processes. 4,288,328, Cl. 210-713.000.
Moody, Warren E. Reusable reserve battery system. 4,288,501, Cl. 429-70.000.
Moore, Donald H. Door latch assembly. 4,288,120, Cl. 292-341.180.
Moore, Lewis F.; and Price, George M., to Frymaster Corporation, The. Automatic fryer for breaded products. 4,287,818, Cl. 99-355.000.
Moplefan S.p.A.: *See*—
Bordini, Fosco; and Mauri, Luigi, 4,288,477, Cl. 428-35.000.
Moreau, Joel P. Safety barrier which is especially useful for motorways. 4,288,061, Cl. 256-13.100.
Morehouse Industries, Inc.: *See*—
Clark, Ralph E., 4,287,724, Cl. 62-272.000.
Morgan, Charles R., to W. R. Grace & Co. Dual UV/thermally curable acrylate compositions with pinacol. 4,288,527, Cl. 430-288.000.
Morgan, James A.: *See*—
Ingard, Uno; Morgan, James A.; and Hirschorn, Martin, 4,287,962, Cl. 181-224.000.
Morgan, Lawrence A.: *See*—
Abdulla, Riaz F.; and Morgan, Lawrence A., 4,288,624, Cl. 564-345.000.
Mori, Shunji: *See*—
Otsu, Nobuyuki; Mori, Shunji; and Saito, Taiichi, 4,288,779, Cl. 340-146.30Y.
Morimoto, Yoshinori; and Kobayashi, Takehiro, to Ryobi, Ltd. Spinning reel with anti-reversal mechanism. 4,288,046, Cl. 242-84.21R.
Morin, Robert W., to Boston Machine Works Company. Tape applying machine. 4,288,280, Cl. 156-510.000.
Moriya, Takehiko, to Mitsubishi Gas Chemical Company, Inc. Container sealing member with oxygen absorbent. 4,287,995, Cl. 215-228.000.
Morris, Henry B.: *See*—
Bate, Robert T.; and Morris, Henry B., 4,288,470, Cl. 427-88.000.
Morrisey, John C., IV; and Smith, Ulus R., to Allied Corporation. Benefication of fluorspar ores. 4,288,315, Cl. 209-11.000.
Morrison, Robert I., to MPD Enterprises of Delavan, Inc. Simplified snowmobile support dolly. 4,288,087, Cl. 280-47.320.
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., to Burroughs Wellcome Co. Pyrido derivatives. 4,288,365, Cl. 260-243.300.
Morrison, Russell J., to Whirlpool Corporation. Automatic washer timer dial protective shield. 4,288,671, Cl. 200-304.000.
Morton, Edward W., to Westinghouse Electric Corp. Lightweight fluorescent lamp ballast. 4,288,725, Cl. 315-245.000.
Moser, Helmut: *See*—
Nutz, Karl-Diether; and Moser, Helmut, 4,288,740, Cl. 323-303.000.
Moskowitz, David: *See*—
Terner, Leslie L.; Van Alsten, Roy L.; and Moskowitz, David, 4,288,495, Cl. 428-446.000.
Moskowitz, Paul M.; Rushansky, Yuliy; Brown, Lester; and Weinstein, Gerald, to Salton, Inc. Apparatus for use in preparing infusions. 4,287,817, Cl. 99-282.000.
Mossell, Alan T.; Simmons, James R.; and Middleton, Charles G., to Interlake, Inc. Heat-sealing strapping machine. 4,288,270, Cl. 156-359.000.
Mostek Corporation: *See*—
Graham, Andrew C., 4,288,865, Cl. 365-229.000.
Motorola, Inc.: *See*—
Ahrons, Richard W., 4,288,694, Cl. 250-374.000.
Bedard, Brian E.; and Geller, Gary R., 4,288,530, Cl. 430-315.000.
Dolikian, Arman V., 4,288,831, Cl. 361-92.000.
Mounteer, Carlyle A.; and Poteet, Ronald L., to Gulton Industries, Inc. Strain gage transducer and process for fabricating same. 4,287,772, Cl. 73-720.000.
Mouri, Kunihiko: *See*—
Ito, Hayami; Nagai, Chiaki; Nakabayashi, Yasuyuki; Igarashi, Kihachiro; Mouri, Kunihiko; and Ikeda, Takashi, 4,288,420, Cl. 423-239.000.
Moynihan, Philip I.: *See*—
United States of America, National Aeronautics and Space Administration; Moynihan, Philip I.; and Young, Donald L., 4,287,838, Cl. 110-234.000.
Mozhaiko, Viktor N.: *See*—
Rabinovich, Georgy L.; Maslyansky, Gdal N.; Birjukova, Ljubov M.; Levitsky, Emmanuil A.; Volkova, Kira L.; Lukina, Zoya P.; and Mozhaiko, Viktor N., 4,288,347, Cl. 252-439.000.
MPD Enterprises of Delavan, Inc.: *See*—
Morrison, Robert I., 4,288,087, Cl. 280-47.320.
Mueller, Claus D.: *See*—
Bliesener, Jens-Uwe; Geiss, Karl-Heinz; Lenke, Dieter; and Mueller, Claus D., 4,288,449, Cl. 424-274.000.
Mues, Volker; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Combating arthropods with ferrocene-containing synergistic compositions. 4,288,451, Cl. 424-295.000.
Muijs, Herman M.: *See*—
Shepley, John D.; and Muijs, Herman M., 4,288,331, Cl. 252-8.900.
Mukai, Naoto: *See*—
Okamoto, Syuzi; and Mukai, Naoto, 4,287,984, Cl. 198-847.000.
Mukai, Sadayoshi: *See*—
Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Hara, Yasutoshi, 4,288,837, Cl. 361-315.000.
Mukri, Louis E. Ski accessory. 4,288,092, Cl. 280-605.000.
Mullen, William T. Expansible caulking material. 4,287,696, Cl. 52-309.700.
Muller, Beat: *See*—
Schaffner, Karl; Wehrli, Hansuli; Muller, Beat; and Scartazzini, Riccardo, 4,288,364, Cl. 260-239.00A.
Muller, Franz; and Muller, Helmut. Elastic lateral support with supporting wheel for children's bicycles. 4,288,090, Cl. 280-293.000.
Muller, Gerhard: *See*—
Bodenbenner, Kurt; Muller, Gerhard; and Perkow, Helmut, 4,288,211, Cl. 431-346.000.
Muller, Hanns P.; Rabe, Hansjurgen; and Wagner, Kuno, to Bayer Aktiengesellschaft. Process for the production of highly elastic foams containing urethane groups from polyethers, modified polyisocyanates and cross-linking agents. 4,288,566, Cl. 521-158.000.
Muller, Helmut: *See*—
Muller, Franz; and Muller, Helmut, 4,288,090, Cl. 280-293.000.
Muller, Walter: *See*—
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Muller, Wolf E.: *See*—
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Murakami, Masuo: *See*—
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,288,438, Cl. 424-251.000.
Murata, Hiroshi: *See*—
Sado, Ichiro; Kishimoto, Juji; and Murata, Hiroshi, 4,288,792, Cl. 340-756.000.
Murata, Masayoshi: *See*—
Takaya, Takao; and Murata, Masayoshi, 4,288,436, Cl. 424-246.000.
Murtin, Fernand R. C., to Generale de Fluide. Method and apparatus for measuring oxygen concentration. 4,288,749, Cl. 324-464.000.
Muto, Naoki: *See*—
Fujii, Tadashiro; Yaginuma, Satoshi; Muto, Naoki; and Hayashi, Mitsuo, 4,288,429, Cl. 424-117.000.
MWL Tool and Supply Company: *See*—
Lindsey, Hiram E., Jr., 4,287,949, Cl. 166-212.000.
Myatt, Hal: *See*—
McCracken, Philip G.; Myatt, Hal; and Petree, Harris E., 4,288,594, Cl. 544-204.000.
Myers, Douglas: *See*—
Vandenkieboom, John; and Myers, Douglas, 4,288,182, Cl. 408-129.000.
Myers, Drewfus Y., Jr.; and Hawks, George H., III, to Eastman Kodak Company. Photographic elements containing encapsulated polymers coordinated with metal ions. 4,288,511, Cl. 430-17.000.
Naarden International N.V.: *See*—
Boelens, Harmannus; and Ter Heide, Roelof, 4,288,349, Cl. 252-522.00R.
Nachbur, Hermann; and Rohringer, Peter, to Ciba-Geigy Corporation. Process for flameproofing organic fibrous material with phosphonic acid salts. 4,288,489, Cl. 428-265.000.
Nagai, Chiaki: *See*—
Ito, Hayami; Nagai, Chiaki; Nakabayashi, Yasuyuki; Igarashi, Kihachiro; Mouri, Kunihiko; and Ikeda, Takashi, 4,288,420, Cl. 423-239.000.
Nagashima, Yukio: *See*—
Sakakibara, Tadamori; Matsushima, Yoshihisa; Nagashima, Yukio; Okamoto, Nobukazu; Kaneko, Katsumi; Ishii, Yohio; and Wada, Shozo, 4,288,634, Cl. 568-454.000.
Nagata, Koichi: *See*—
Arimatsu, Seiji; Ishikawa, Katsukiyo; Umeda, Yasusi; and Nagata, Koichi, 4,288,517, Cl. 430-110.000.
Naimpally, Saiprasad V., to RCA Corporation. Luminance and chrominance signal separation network. 4,288,811, Cl. 358-31.000.
Naito, Takayuki: *See*—
Oka, Masahisa; Okumura, Jun; and Naito, Takayuki, 4,288,590, Cl. 544-25.000.
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Hatano, Masashi; Hagiwara, Tatsuo; Mikamo, Masaaki; Ebihara, Yoshimasa; Tomura, Yasutomo; and Imai, Keiji, to Electric Power Development Co. Ltd.; and Kawasaki Jukogyo Kabushiki Kaisha. Apparatus for production of stable slurry of milled coal and a hydrocarbon oil. 4,288,166, Cl. 366-149.000.
Nakabayashi, Yasuyuki: *See*—
Ito, Hayami; Nagai, Chiaki; Nakabayashi, Yasuyuki; Igarashi, Kihachiro; Mouri, Kunihiko; and Ikeda, Takashi, 4,288,420, Cl. 423-239.000.
Nakahara, Fukumori: *See*—
Yamamoto, Ryuji; Nakahara, Fukumori; and Kasai, Tadao, 4,288,823, Cl. 360-73.000.
Nakai, Taiichiro; Furusawa, Kahei; Nunokawa, Makoto; and Ejiri, Yoshihiro, to Kokusai Denshin Denwa Kabushiki Kaisha. Optical fiber submarine cable. 4,288,144, Cl. 350-96.230.
Nakai, Yoshiharu: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,288,435, Cl. 424-246.000.
Nakamura, Kazuo: *See*—
Hiromae, Yoshitaka; Nakamura, Kazuo; Wada, Toshiya; and Katoh, Hirotada, 4,288,492, Cl. 428-336.000.

Nakamura, Michiharu: *See*—
Kajimura, Takashi; Hirao, Motohisa; Nakamura, Michiharu; Kuroda, Takao; Yamashita, Shigeo; and Umeda, Jun-Ichi, 4,288,757, Cl. 331-94.50H.
Nakamura, Shuji: *See*—
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Nakamura, Takayuki: *See*—
Matsunaga, Fujihisa; Shinohara, Yoshiyuki; Okubo, Isamu; Nakamura, Takayuki; and Tanaka, Seiichi, 4,288,637, Cl. 568-575.000.
Nakanishi, Koji: *See*—
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Nakanishi Metal Works Co., Ltd.: *See*—
Wakabayashi, Takao, 4,287,829, Cl. 104-172.00S.
Nakano, Yoshiyuki: *See*—
Hibino, Yozo; Oizumi, Junichi; Nishida, Hideo; Nakano, Yoshiyuki; and Ohmachi, Hiroshi, 4,288,198, Cl. 415-1.000.
Nakazawa, Koji: *See*—
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Nalesnik, Theodore E.: *See*—
Holy, Norman L.; and Nalesnik, Theodore E., 4,288,369, Cl. 260-333.000.
Nam, Kyong H.: *See*—
Seguin, Herb J. J.; Tulip, John; and Nam, Kyong H., 4,288,758, Cl. 331-94.5PE.
Namiki, Ryoichi: *See*—
Kutsuwada, Noboru; Saito, Minoru; Namiki, Ryoichi; and Kusunoki, Katsuo, 4,288,514, Cl. 430-54.000.
Napier, David. Jar carrier having U-shaped jar retainers. 4,288,013, Cl. 294-87.200.
Napier, Roger P.: *See*—
Horn, James M.; Johnston, Byron E.; Napier, Roger P.; and Williams, Thomas N., 4,288,392, Cl. 260-983.000.
Narasimhan, Mandayam J.; and Anderson, John A., to University of Minnesota, The Regents of the. Process for the large scale production of pituitary hormones by serial secondary suspension culture. 4,288,546, Cl. 435-70.000.
Nardi, Giovanni, to Whitehead Motofides, S.p.A. Lock for motor vehicle doors. 4,288,117, Cl. 292-52.000.
Naruse, Kazumichi: *See*—
Takada, Shigetaka; and Naruse, Kazumichi, 4,287,864, Cl. 123-440.000.
National Ham Company: *See*—
Urban, Robert F., 4,287,820, Cl. 99-538.000.
National Research Development Corp.: *See*—
Leonard, Ian C. A.; and Jones, Barry E., 4,287,808, Cl. 87-44.000.
National Steel Corporation: *See*—
Peters, Gordon L.; and Smith, John R., 4,287,741, Cl. 72-42.000.
Naylor, Carter G.: *See*—
McCoy, David R.; and Naylor, Carter G., 4,288,334, Cl. 252-8.55D.
Nazyrov, Ravil N.: *See*—
Grigorov, Sergei S.; and Nazyrov, Ravil N., 4,287,896, Cl. 128-786.000.
Neary, John R. Method and apparatus for tensioning a drum. 4,287,806, Cl. 84-458.000.
Neeff, Rutger: *See*—
Rolf, Meinhard; Neeff, Rutger; and Muller, Walter, 4,288,362, Cl. 260-154.000.
Neely, Allen B., Jr. Alfalfa harvesting and processing apparatus. 4,287,708, Cl. 56-13.500.
Neely, James E., to PPG Industries, Inc. Method of making low temperature curable silicate compositions. 4,288,252, Cl. 106-74.000.
Neirinckx, Rudi D.; and Davis, Michael A. Generator for ionic gallium-68 based on column chromatography. 4,288,424, Cl. 424-1.000.
Nekoosa Papers Inc.: *See*—
Lodzinski, Fred P., 4,288,160, Cl. 356-73.000.
Nelson, John R., to Research, Development & Marketing. Foldable bucksaw. 4,287,922, Cl. 145-32.00R.
Nelson, William J.: *See*—
Barrett, Steven P.; and Nelson, William J., 4,288,548, Cl. 435-94.000.
Nemoto, Susumu; and Fujieda, Toshio, to Nippon Kokan Kabushiki Kaisha. Raw material distributing apparatus for a furnace. 4,288,194, Cl. 414-586.000.
Nercessian, Sarkis, to Kepco, Inc. Dynamic load for testing regulated power supplies. 4,288,739, Cl. 323-275.000.
Netzsch-Mohnopumpen GmbH: *See*—
Hantschk, Gunther, 4,287,743, Cl. 72-98.000.
Neumeier, Erich: *See*—
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New Balance Athletic Shoe, Inc.: *See*—
Norton, Edward J.; and Flanagan, Charles J., 4,287,675, Cl. 36-129.000.
Newage Engineers Limited: *See*—
Wright, Michael J., 4,288,736, Cl. 322-28.000.
Newberry, Robert H. Chuck collar. 4,288,084, Cl. 279-60.000.
Newbold, Robert W., Jr., to Plas-Tanks Industries, Inc. Reinforced plastic container with an integral heating element and a method of forming the same. 4,287,663, Cl. 29-611.000.
Newkirk, Raymond K.: *See*—
Campbell, Glenn M., Jr.; and Newkirk, Raymond K., 4,288,271, Cl. 156-359.000.
Newman, David P., to Yellow Springs Instrument Company, Inc., The. Optical temperature transducer. 4,288,159, Cl. 356-44.000.
Newton, Cleland O.; and Paige, Edward G. S., to United States of America, Army. Surface acoustic wave time chirp devices. 4,288,750, Cl. 328-158.000.
Newton, Robert E.: *See*—
Dechene, Ronald L.; and Newton, Robert E., 4,288,741, Cl. 324-61.00R.
NGK Insulators, Ltd.: *See*—
Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, 4,288,251, Cl. 501-105.000.
NGK Spark Plug Co., Ltd.: *See*—
Takami, Akio; Matsuura, Toshitaka; and Saito, Tsutomu, 4,288,774, Cl. 338-34.000.
Yamada, Shigeyasu; Kawamura, Kazumi; and Nakamura, Shuji, 4,288,714, Cl. 313-142.000.
NHK Spring Co., Ltd.: *See*—
Misumi, Atsushi; and Kimura, Yoshio, 4,287,969, Cl. 188-134.000.
Nicholas, Keith H., to U.S. Philips Corporation. Methods of manufacturing semiconduetor devices. 4,287,660, Cl. 29-571.000.
Nick, Albert T. Expansion and contraction joint assembly. 4,288,173, Cl. 404-49.000.
Nickey, George A.: *See*—
Heckman, Russell W.; and Nickey, George A., 4,288,466, Cl. 427-28.000.
Nidola, Antonio: *See*—
de Nora, Vittorio; Bianchi, Giuseppe; and Nidola, Antonio, 4,288,302, Cl. 204-105.00R.
Niemann, Roy A., to General Electric Company. Apparatus for fabricating isolated phase bus. 4,288,681, Cl. 219-125.110.
Nieuwland, Kees N.; and Kettenes, Dirk K., to Polak's Frutal Works B.V. Perfume compositions containing dialkyl delta-lactones. 4,288,350, Cl. 252-522.00R.
Nigg, Egon: *See*—
Hartmannsgruber, Max; Nigg, Egon; and Hack, Kurt, 4,287,711, Cl. 57-130.000.
Niimi, Masayoshi; Torii, Koshi; and Kato, Hidetoshi, to Nippondenso Co., Ltd. Electric vehicle control apparatus. 4,288,728, Cl. 318-139.000.
Ning, Tak H.; Osburn, Carlton M.; and Yu, Hwa N., to International Business Machines Corporation. Method of making FET containing stacked gates. 4,288,256, Cl. 148-1.500.
Nippert Company, The: *See*—
Nippert, Russell A., 4,288,024, Cl. 228-155.000.
Nippert, Russell A., to Nippert Company, The. Method for making a bimetal resistance welding electrode. 4,288,024, Cl. 228-155.000.
Nippon Electric Co., Ltd.: *See*—
Araseki, Takashi, 4,288,664, Cl. 179-170.200.
Babano, Sotoaki, 4,288,753, Cl. 330-51.000.
Minamibayashi, Seisaku; Ishikawa, Takashi; and Ogawa, Takashi, 4,288,820, Cl. 358-280.000.
Yoshida, Ikio; Kage, Kouzou; Ikeda, Kazuhiro; and Sato, Yasuo, 4,288,751, Cl. 328-173.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Hirose, Yasunori, 4,287,804, Cl. 84-1.190.
Imamura, Akio; and Katada, Naota, 4,287,802, Cl. 84-1.010.
Yoshida, Takashi; Matsuyama, Takeshi; Kuki, Tamaki; and Kodaka, Takayuki, 4,288,800, Cl. 357-22.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Kawabata, Shigeo; and Inazaki, Norihisa, 4,288,747, Cl. 324-207.000.
Nemoto, Susumu; and Fujieda, Toshio, 4,288,194, Cl. 414-586.000.
Nippon Oil Company, Limited: *See*—
Miyoshi, Mitsuji; Tajima, Yoshio; Matsuura, Kazuo; Kuroda, Nobuyuki; and Matsuno, Mitsuo, 4,288,579, Cl. 526-124.000.
Nippon Oil Seal Industry, Co., Ltd.: *See*—
Jinnouchi, Takeshi, 4,287,814, Cl. 92-43.000.
Nippon Paint Co., Ltd.: *See*—
Arimatsu, Seiji; Ishikawa, Katsukiyo; Umeda, Yasusi; and Nagata, Koichi, 4,288,517, Cl. 430-110.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Ueda, Takeo, 4,288,097, Cl. 280-802.000.
Nippon Sheet Glass: *See*—
Kanazawa, Hiroyuki; and Futagami, Mikio, 4,288,357, Cl. 260-31.20N.
Nippon Soken, Inc.: *See*—
Noguchi, Masaaki; Tanaka, Taro; and Kato, Yoji, 4,287,862, Cl. 123-310.000.
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; Shimogawa, Toshiaki; and Chiba, Seiichi, 4,288,098, Cl. 280-806.000.
Yasuda, Eturo; Segawa, Yoshihiro; and Ohta, Minoru, 4,287,751, Cl. 73-23.000.
Nippon Steel Corporation: *See*—
Hiromae, Yoshitaka; Nakamura, Kazuo; Wada, Toshiya; and Katoh, Hirotada, 4,288,492, Cl. 428-336.000.
Nippon Telegraph and Telephone Public Corp.: *See*—
Ohhinata, Ichiro; Ohkoshi, Seiei; and Suzuki, Hideo, 4,288,862, Cl. 365-181.000.
Nippondenso Co., Ltd.: *See*—
Niimi, Masayoshi; Torii, Koshi; and Kato, Hidetoshi, 4,288,728, Cl. 318-139.000.
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Nishida, Hideo: *See*—
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Nishimatsu, Mineaki; Mukai, Sadayoshi; Hayashi, Yoshinori; Yamaguchi, Osamu; Ito, Akira; and Hara, Yasutoshi. Electrical capacitor. 4,288,837, Cl. 361-315.000.

Nishimura, Shigeyuki: *See—*
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, 4,288,599, Cl. 546-345.000.

Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, to Ishihara Sangyo Kaisha Ltd. Process for producing pyridine derivatives having a trifluoromethyl group at β-position thereof. 4,288,599, Cl. 546-345.000.

Nissan Motor Co., Ltd.: *See—*
Koshimaru, Hajime; and Ishii, Shohju, 4,287,747, Cl. 72-358.000.

Nissen, Axel; Rebafka, Walter; and Aquila, Werner, to BASF Aktiengesellschaft. Preparation of citral. 4,288,636, Cl. 568-486.000.

Nitto Boseki Co., Ltd.: *See—*
Fujita, Toshihito; Kikuchi, Toshiaki; and Nakazawa, Koji, 4,287,799, Cl. 83-347.000.

Nitzsche, John K.: *See—*
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Niu, Joseph H. Y.: *See—*
Schmolka, Irving R.; and Niu, Joseph H. Y., 4,288,232, Cl. 44-51.000.

NL CHEM Canada Inc.: *See—*
Gladu, Yves, 4,288,254, Cl. 106-300.000.

NL Industries, Inc.: *See—*
Davis, Brian R.; and Rahm, Joseph A., 4,288,416, Cl. 423-82.000.
Davis, Brian R.; and Rahm, Joseph A., 4,288,418, Cl. 423-83.000.
Rahm, Joseph A.; and Cole, Donald G., 4,288,415, Cl. 423-82.000.
Rahm, Joseph A.; and Cole, Donald G., 4,288,417, Cl. 423-83.000.

Noel, Francis E., Jr.: *See—*
Kolodzey, James S.; Noel, Francis E., Jr.; and Stilwell, George R., Jr., 4,288,869, Cl. 370-31.000.

Noguchi, Kohji: *See—*
Yamashita, Keitaro; and Noguchi, Kohji, 4,288,515, Cl. 430-100.000.

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Noguchi, Masaaki; Tanaka, Taro; and Kato, Yoji, to Nippon Soken, Inc. Otto-cycle internal combustion engine. 4,287,862, Cl. 123-310.000.

Nordin, Olof, to Forsheda Gummifabrik AB. Pipe section, preferably a concrete pipe section. 4,288,104, Cl. 285-45.000.

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Norlin Industries, Inc.: *See—*
Gross, Glenn, 4,287,805, Cl. 84-1.260.

Norman, Bo: *See—*
de Ruvo, Alfonso; Norman, Bo; Duffy, Geoffrey G.; Moller, Klaus; Hansen, Karl E.; Felsvang, Karsten S.; and Liborius, Erik, 4,288,317, Cl. 209-139.00A.

Norota, Susumu; Kiriyama, Tsutomu; and Imoto, Tadasi, to Teijin Limited. Novel fibrous assembly and process for production thereof. 4,288,484, Cl. 428-113.000.

Norton, Edward J.; and Flanagan, Charles J., to New Balance Athletic Shoe, Inc. Counter for athletic shoe. 4,287,675, Cl. 36-129.000.

Novo Industri A/S: *See—*
Gestrelius, Stina M., 4,288,552, Cl. 435-174.000.

Nowak, Rudolf: *See—*
Holland, Gerhard; and Nowak, Rudolf, 4,288,411, Cl. 423-1.000.

Numazawa, Akio; and Arai, Hajime, to Toyota Jidosha Kogyo Kabushiki Kaisha. Power transmission unit for automotive vehicles. 4,287,791, Cl. 74-701.000.

Nunokawa, Makoto: *See—*
Nakai, Taiichiro; Furusawa, Kahei; Nunokawa, Makoto; and Ejiri, Yoshihiro, 4,288,144, Cl. 350-96.230.

Nutz, Karl-Diether; and Moser, Helmut, to Licentia Patent-Verwaltungs-G.m.b.H. Constant current switch. 4,288,740, Cl. 323-303.000.

N.V. Papierfabriek Gennep: *See—*
Heijs, Karel A. G.; Dechamps, Antonius J.; and de Jong, Robert L., 4,288,319, Cl. 209-166.000.

Oban, Harold C.; and Peterson, Charles M., to International Harvester Company. Fuel tank arrangement for a tractor. 4,288,086, Cl. 280-5.00A.

Obata, Osamu: *See—*
Kashioka, Seiji; Shima, Yoshihiro; Miyatake, Takafumi; Ejiri, Masakazu; and Obata, Osamu, 4,288,816, Cl. 358-138.000.

Oberhardt, Bruce J., to Technicon Instruments Corporation. Whole blood analyses and diffusion apparatus therefor. 4,288,228, Cl. 23-230.00R.

Obinata, Akio, to Orion Machinery Co., Ltd. Heating apparatus. 4,288,218, Cl. 432-222.000.

O'Brien, John P.: *See—*
United States of America, National Aeronautics and Space Administration; Allcock, Harry R.; O'Brien, John P.; Scopelianos, Angelo G.; and Fewell, Larry L., 4,288,585, Cl. 528-4.000.

Oda Gosen Kogyo Kabushiki Kaisha: *See—*
Takai, Isao, 4,287,714, Cl. 57-336.000.

Oda, Kazutaka; and Okishi, Yoshio, to Fuji Photo Film Co., Ltd. Light-sensitive printing plates with discontinuous over-coating. 4,288,526, Cl. 430-272.000.

Odawara, Yoji: *See—*
Ishida, Masahiko; Haga, Ryoichi; and Odawara, Yoji, 4,288,550, Cl. 435-167.000.

Offner, Abe; and Markle, David A., to Perkin-Elmer Corporation, The. Beam-splitting optical system. 4,288,148, Cl. 350-453.000.

Offshore Power Systems: *See—*
Dickey, Jimmy R., 4,287,718, Cl. 60-687.000.

Ogawa, Atsushi, to Trio Kabushiki Kaisha. Stereo demodulator with high frequency de-emphasis compensation. 4,288,752, Cl. 329-50.000.

Ogawa, Takashi: *See—*
Minamibayashi, Seisaku; Ishikawa, Takashi; and Ogawa, Takashi, 4,288,820, Cl. 358-280.000.

Ogura, Osamu: *See—*
Katagiri, Masayoshi; and Ogura, Osamu, 4,287,811, Cl. 91-369.00A.

O'Hare, Louis R. Wind tower turbine. 4,288,200, Cl. 415-2.00R.

Ohhinata, Ichiro; Ohkoshi, Seiei; and Suzuki, Hideo, to Nippon Telegraph and Telephone Public Corp.; and Hitachi, Ltd. Memory circuit. 4,288,862, Cl. 365-181.000.

Ohkado, Michio, to Sharp Kabushiki Kaisha. Door lock mechanism of microwave oven. 4,288,118, Cl. 292-201.000.

Ohkoshi, Seiei: *See—*
Ohhinata, Ichiro; Ohkoshi, Seiei; and Suzuki, Hideo, 4,288,862, Cl. 365-181.000.

Ohlendorf, Rolf: *See—*
Schuster, Hans-Dieter; Jans, Karl; and Ohlendorf, Rolf, 4,287,716, Cl. 60-276.000.

Ohmachi, Hiroshi: *See—*
Hibino, Yozo; Oizumi, Junichi; Nishida, Hideo; Nakano, Yoshiyuki; and Ohmachi, Hiroshi, 4,288,198, Cl. 415-1.000.

Ohmi, Hidehiko, to Toyo Seikan Kaisha, Ltd. Apparatus for distributing lining material in cap shells. 4,287,847, Cl. 118-215.000.

Ohsaka, Yohnosuke; and Tohzuka, Takashi, to Daikin Kogyo Co., Ltd. Process for preparing hexafluoropropene oxide. 4,288,376, Cl. 260-348.230.

Ohshima, Shoichi: *See—*
Ida, Shiuichiro; Ohshima, Shoichi; Hirashima, Syunichi; and Harada Yukihiro, 4,287,783, Cl. 74-467.000.

Ohta, Minoru: *See—*
Yasuda, Eturo; Segawa, Yoshihiro; and Ohta, Minoru, 4,287,751, Cl. 73-23.000.

Ohya, Isao: *See—*
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Oizumi, Junichi: *See—*
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Oka, Masahisa; Okumura, Jun; and Naito, Takayuki, to Bristol-Myers Company. 7-[Dα-(4-Hydroxy-1,5-naphthyridine-3-carboxamido)-α-arylacetamido]-3-(N,N-dimethyl-aminomethylpyridinium) methyl-3-cephem-4-carboxylates. 4,288,590, Cl. 544-25.000.

Okada, Takashi; and Kuniyoshi, Yasunobu, to Sony Corporation. Filter circuit. 4,288,754, Cl. 330-260.000.

Okamoto, Nobukazu: *See—*
Sakakibara, Tadamori; Matsushima, Yoshihisa; Nagashima, Yukio; Okamoto, Nobukazu; Kaneko, Katsumi; Ishii, Yohio; and Wada, Shozo, 4,288,634, Cl. 568-454.000.

Okamoto, Syuzi; and Mukai, Naoto, to Konishiroku Photo Industry Co., Ltd. Belt with plural layers used in the automatic document feeding apparatus. 4,287,984, Cl. 198-847.000.

Okishi, Yoshio: *See—*
Oda, Kazutaka; and Okishi, Yoshio, 4,288,526, Cl. 430-272.000.

Okita, Toshimichi, to Sony Corporation. Microwave circuit. 4,288,766, Cl. 333-204.000.

Okubo, Isamu: *See—*
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Okuda, Takao: *See—*
Saji, Ikutaro; Aono, Shunji; Okuda, Takao; and Agui, Hideo, 4,288,448, Cl. 424-273.00R.

Okumura, Jun: *See—*
Oka, Masahisa; Okumura, Jun; and Naito, Takayuki, 4,288,590, Cl. 544-25.000.

Okumura, Michitoshi: *See—*
Yoshimoto, Hiromu; Okumura, Michitoshi; and Kawate, Kenji, 4,288,261, Cl. 148-131.000.

Olah, George A., to PCUK Produits Chimiques Ugine Kuhlmann. Regioselective preparation of β-isopropylnaphthalene over superacidic solid or supported perfluorinated sulfonic acid catalysts. 4,288,646, Cl. 585-458.000.

Olashaw, William F., to General Electric Company. Bolted/welded joint for switchboard run-in connector. 4,288,656, Cl. 174-71.00B.

Oldfield, Thomas A.; Smith, Edward D.; and Furukawa, Hideo, to Cummins Engine Company, Inc.; and Kabushiki Kaisha Komatsu Seisakusho. Turbocharged internal combustion engine. 4,287,717, Cl. 60-606.000.

Olin Corporation: *See—*
Pryor, Michael J.; and Tyler, Derek E., 4,287,937, Cl. 164-418.000.
Turley, Richard J.; and MacFarland, David R., 4,288,587, Cl. 528-57.000.

Olson, Gary L., to Hoffmann-La Roche Inc. Process for the preparation of esters of 5-formyl-3-methyl-2,4-pentadien-1-ol. 4,288,614, Cl. 560-240.000.

Olympus Optical Company Limited: *See—*
Sato, Masaaki, 4,288,826, Cl. 360-130.330.
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Ong, Lip H., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Signal processing devices. 4,288,764, Cl. 333-165.000.

Ootani, Hisao: *See*—
Haga, Shozi; and Ootani, Hisao, 4,287,977, Cl. 192-91.00A.
Oppenheimer, Edgar D.; Udall, Humfrey N.; and Rudd, Wallace C., to Thermatool Corp. Solar panel elements and method of manufacture thereof. 4,287,947, Cl. 165-183.000.
Orion Machinery Co., Ltd.: *See*—
Obinata, Akio, 4,288,218, Cl. 432-222.000.
Ornstein, Leonard: *See*—
Lee, Martin J.; and Ornstein, Leonard, 4,288,425, Cl. 424-1.000.
Orogil: *See*—
Rivier, Georges, 4,288,335, Cl. 252-32.70E.
Orthodyne Electronics: *See*—
Larrison, John E., 4,288,023, Cl. 228-110.000.
Osborn, Alfred W.: *See*—
Bennett, George H.; Osborn, Alfred W.; Bunyan, Clive N.; and Midgley, Ronald A., 4,287,913, Cl. 137-574.000.
Osborne, Gregory W.; Ripley, William C.; and Wilson, Robert E., to Textron Inc. Shielded loop VOR/ILS antenna system. 4,288,794, Cl. 343-708.000.
Osburn, Carlton M.: *See*—
Ning, Tak H.; Osburn, Carlton M.; and Yu, Hwa N., 4,288,256, Cl. 148-1.500.
Oshio, Hiromichi: *See*—
Kirino, Osamu; Hashimoto, Shunichi; Matsumoto, Hiroshi; and Oshio, Hiromichi, 4,288,244, Cl. 71-118.000.
Ossola, George A.: *See*—
Kaugars, Eugene; and Ossola, George A., 4,288,075, Cl. 273-80.00B.
Ostby & Barton Company: *See*—
Plante, James E.; and Pfeifer, Warren E., 4,288,745, Cl. 324-158.00F.
streicher, Eugene A.: *See*—
Hou, Kenneth C.; and Ostreicher, Eugene A., 4,288,462, Cl. 426-423.000.
Ota, Hiroshi; Sakuma, Noboru; Takarabe, Takeki; and Takiguchi, Isao, to Tokyo Keiki Company Limited. Lightweight materials having a high dielectric constant and their method of manufacture. 4,288,337, Cl. 252-512.000.
Otawara, Yasuhiko: *See*—
Sakata, Shinji; Yokota, Hirakazu; Shimizu, Tasuku; and Otawara, Yasuhiko, 4,288,677, Cl. 219-121.0ED.
Otis Elevator Company: *See*—
Cilderman, Janis J.; and Kirincich, Joseph G., 4,287,651, Cl. 29-159.00R.
Otis Engineering Corporation: *See*—
Setterberg, John R., Jr., 4,288,082, Cl. 277-125.000.
Otoshi, Kazuo, to Tatsumi Seiki Co., Ltd. Flat bed knitting machine. 4,287,727, Cl. 66-75.200.
Otsu, Nobuyuki; Mori, Shunji; and Saito, Taiichi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method and apparatus for character reading. 4,288,779, Cl. 340-146.30Y.
Ottestad, Nils T. Method and device for conditioning of breathing air for divers. 4,288,396, Cl. 261-128.000.
Otto, Charles W., to General Electric Company. Method of assembling. 4,287,662, Cl. 29-596.000.
Outboard Marine Corporation: *See*—
Banski, Thomas J.; and Riedner, Robert J., 4,288,246, Cl. 75-68.00R.
Dudleston, Alan R.; and Stemper, Harry, 4,287,789, Cl. 74-516.000.
Owens-Illinois, Inc.: *See*—
Heckman, Russell W.; and Nickey, George A., 4,288,466, Cl. 427-28.000.
Oyague, Ralph; and Spector, George. Foldable gameboard and disc playing piece apparatus. 4,288,076, Cl. 273-126.00R.
Oyokota, Shigeru: *See*—
Ueda, Hiroshi; and Oyokota, Shigeru, 4,288,771, Cl. 335-230.000.
Ozaki, Yoshiaki, to Janome Sewing Machine Co., Ltd. Electric sewing machine with a speed control system. 4,287,843, Cl. 112-277.000.
Ozawa, Takashi; and Takenouchi, Mutsuo, to Fuji Xerox Co., Ltd. Image pickup device having electrode matrix coupling. 4,288,702, Cl. 250-578.000.
Pacciarini, Antonio; and Bertoldo, Giorgio, to Industrie Pirelli S.p.A. Process and apparatus for manufacturing radial tires. 4,288,265, Cl. 156-126.000.
Pacharis, George H.; and Sadanandan, Kunissery P., to USM Corporation. Pull-to-set anchoring device. 4,287,807, Cl. 411-42.000.
Paige, Edward G. S.: *See*—
Newton, Cleland O.; and Paige, Edward G. S., 4,288,750, Cl. 328-158.000.
Pako Corporation: *See*—
Henk, Keith L., 4,288,205, Cl. 417-477.000.
Palazzetti, Mario; Boero, Angioletta; Demichelis, Francesca; and Minetti-Mezzetti, Enrica, to Centro Ricerche Fiat S.p.A. Solar energy absorber for use with a linear optical concentrating system. 4,287,881, Cl. 126-440.000.
Palitex Project Company GmbH: *See*—
Franzen, Gustav, 4,287,712, Cl. 57-279.000.
Palla, Jean-Claude: *See*—
Belloc, Andre; Florent, Jean; Lunel, Jean; Palla, Jean-Claude; and Mancy, Denise, 4,288,556, Cl. 435-265.000.
Palmer, Richard C.: *See*—
Mindel, Michael J.; Miller, Michael E.; Rustman, James C.; and Palmer, Richard C., 4,287,689, Cl. 51-320.000.
Palmer, William D. Tool for preparing tube ends for welding. 4,287,796, Cl. 82-4.00C.
Pamrod, Incorporated: *See*—
Venable, Joseph M., 4,288,253, Cl. 106-84.000.
Panetti, Romolo, to Speno International, S.A. Device for measuring deformations of the travel surface of the rails of a railway. 4,288,855, Cl. 364-561.000.
Paolucci, Paride: *See*—
Gozzo, Franco; Paolucci, Paride; and Longoni, Angelo, 4,288,611, Cl. 560-133.000.
Papacostas, George: *See*—
Vazquez-Cuervo, Alfonso; Richards, Frederick T.; Bafunno, Daniel V.; and Papacostas, George, 4,288,726, Cl. 318-54.000.
Papuchon, Michel; Puech, Claude; and Anne, Jean C., to Thomson-CSF. Light intensity modulator with digital control and a digital-analog converter comprising such a modulator. 4,288,785, Cl. 340-347.0DA.
Pardee, Richard H.: *See*—
Widmer, Gerald L.; Gray, Larry J.; and Pardee, Richard H., 4,288,034, Cl. 239-168.000.
Park, Dong-Sil: *See*—
Chatterji, Debajyoti; and Park, Dong-Sil, 4,287,664, Cl. 29-623.200.
Parker-Hannifin Corporation: *See*—
Saulnier, Charly J., 4,288,113, Cl. 285-238.000.
Parsons, David; and Hodkinson, Harold, to Automotive Products Limited. Air assisted braking system. 4,288,126, Cl. 303-6.00C.
Pascal, Helene M.; and Emeury, Jean-Marie L., to Societe Nationale des Poudres et Explosifs. Process for the synthesis of 2,4-dinitro-6-t-butyl-3-methylanisole, referred to as musk ambrette. 4,288,638, Cl. 568-584.000.
Pasquarella, Vincenzo: *See*—
Anzalone, Luigi, 4,287,858, Cl. 123-43.0AA.
Pasternack, Adalbert: *See*—
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Patak, Richard J.: *See*—
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Patel, Jayant M.; Wolfe, Jerome K.; Coyle, Forrest E.; and Farley, James R., to Westinghouse Electric Corp. Telescoping disconnect switch with rail-mounted telescope section. 4,288,667, Cl. 200-48.00R.
Patel, Raman: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,288,570, Cl. 525-133.000.
Patent Products, Inc.: *See*—
Smith, Edward R., 4,288,188, Cl. 410-97.000.
Patrick, Henry W., to Diazit Company, Inc. Variable volume diazotype developing apparatus and method. 4,288,155, Cl. 354-300.000.
Paul Forkardt Kommanditgesellschaft: *See*—
Antoni, Herbert, 4,288,085, Cl. 279-121.000.
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Collette, Roderick E., 4,287,693, Cl. 52-177.000.
PCUK Produits Chimiques Ugine Kuhlmann: *See*—
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Alexander, Clifton E.; Ford, Thomas R.; and Smith, William S., 4,287,692, Cl. 52-116.000.
Pearson, Alan D.; and Pearson, Gary L. Hoist pad. 4,287,965, Cl. 187-8.750.
Pearson, David D.; and Lemkey, Franklin D., to United Technologies Corporation. Tantalum modified gamma prime-alpha eutectic alloy. 4,288,259, Cl. 148-32.000.
Pearson, Gary L.: *See*—
Pearson, Alan D.; and Pearson, Gary L., 4,287,965, Cl. 187-8.750.
Pechko, Evgeny Y.: *See*—
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Peckham, Victor A.: *See*—
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Pecoraro, Theresa A.: *See*—
Chianelli, Russell R.; and Pecoraro, Theresa A., 4,288,422, Cl. 423-509.000.
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Peelman, Harold E.; and Bridges, James R., to Halliburton Company. Well logging neutron generator control system. 4,288,696, Cl. 250-502.000.
Pengue, Leonard M.: *See*—
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Pennwalt Corporation: *See*—
Waltke, Robert W., 4,288,220, Cl. 433-74.000.
Perez, Thomas. Pipe cleaning apparatus. 4,287,630, Cl. 15-104.3SN.
Perfect Measuring Tape Company, The: *See*—
Bohnengel, Andrew C., 4,288,043, Cl. 242-55.000.
Perkin-Elmer Corporation, The: *See*—
Offner, Abe; and Markle, David A., 4,288,148, Cl. 350-453.000.
Sellner, Harvey R.; and Wada, Robert T., 4,288,781, Cl. 340-146.30Q.
Perkins, Rex H., to Sanscord Australia Pty. Limited. Self-supporting and self-contained elevator. 4,287,967, Cl. 187-24.000.

Perkow, Helmut: *See—*
Bodenbenner, Kurt; Muller, Gerhard; and Perkow, Helmut, 4,288,211, Cl. 431-346.000.
Perricone, Alphonse C.: *See—*
Lucas, James M.; Perricone, Alphonse C.; and Enright, Dorothy P., 4,288,582, Cl. 526-240.000.
Perry, Raymond S.: *See—*
Failla, Stephen J.; and Perry, Raymond S., 4,288,016, Cl. 227-30.000.
Persoons, Gustaaf M.; and Wijts, Corneel C., to FMC Corporation. Harvesters. 4,287,707, Cl. 56-12.800.
Persson, Gustaf A. Frame saw with horizontally movable guide system. 4,287,800, Cl. 83-425.300.
Peter, Donald: *See—*
Hooper, David C.; Johnson, George A.; and Peter, Donald, 4,288,341, Cl. 252-107.000.
Peters, Gordon L.; and Smith, John R., to National Steel Corporation. Lubricated tinplate for drawing and ironing operation. 4,287,741, Cl. 72-42.000.
Peters, Joseph L. Securing device for surgical tubes. 4,287,891, Cl. 128-347.000.
Petersen, Egon N.: *See—*
Bier, Gerhard; Kottek, Dagmar; Petersen, Egon N.; Richtzenhain, Hermann; and Vollkommer, Norbert, 4,288,607, Cl. 560-11.000.
Petersen, Frank H., to Betts Machine Company. Tank pressure and vacuum relief mechanism. 4,287,910, Cl. 137-493.900.
Peterson, Charles M.: *See—*
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Peterson, David S., to Champion International Corporation. Openable cardboard lid for extendable popcorn pans. 4,288,027, Cl. 229-43.000.
Petrachonis, Felix: *See—*
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Petrachonis, Frank; and Petrachonis, Felix. Exercise bar. 4,288,073, Cl. 272-123.000.
Petrak, Harry A. Automatic clutch assembly. 4,287,972, Cl. 192-54.000.
Petree, Harris E.: *See—*
McCracken, Philip G.; Myatt, Hal; and Petree, Harris E., 4,288,594, Cl. 544-204.000.
Peuler, Jacob D.: *See—*
Johnson, Garland A.; and Peuler, Jacob D., 4,288,542, Cl. 435-15.000.
Pfeffer, George B., to Datafile Limited. Label applicator with sensor. 4,288,272, Cl. 156-361.000.
Pfeifer, Warren E.: *See—*
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Pfizer Inc.: *See—*
Sielaff, Bruce H.; Praglin, Julius; McKie, James E., Jr.; Longhenry, David K.; Curtiss, Alan C.; and Bidwell, Charles B., 4,288,543, Cl. 435-34.000.
Phillips, Hugh J. Static solar heat storage composition. 4,288,338, Cl. 252-70.000.
Phillips Petroleum Co.: *See—*
Drake, Charles A.; and Turk, Stanley D., 4,288,625, Cl. 564-372.000.
Drake, Charles A., 4,288,626, Cl. 564-491.000.
Kubicek, Donald H., 4,288,627, Cl. 568-26.000.
Reusser, Robert E.; and Jones, Brenton E., 4,288,496, Cl. 428-447.000.
Siedenstrang, Roy W.; and Cornell, William H., 4,288,399, Cl. 264-25.000.
Picquendar, Jean E.; Marchal, Michel; Dubois, Jean C.; and Duda, Eugene, to Thomson-CSF. Method of making an embossed pattern on an information bearing substrate. 4,288,528, Cl. 430-297.000.
Pistorius, Rudolf: *See—*
Mitzlaff, Michael; Cramer, Jurgen; and Pistorius, Rudolf, 4,288,300, Cl. 204-59.00R.
Pitney Bowes Inc.: *See—*
Eckert, Alton B., Jr.; Malin, Richard A.; McFiggans, Robert J.; and Pengue, Leonard M., 4,287,825, Cl. 101-91.000.
Plante, James E.; and Pfeifer, Warren E., to Ostby & Barton Company. Printed circuit board testing means. 4,288,745, Cl. 324-158.00F.
Plas-Tanks Industries, Inc.: *See—*
Newbold, Robert W., Jr., 4,287,663, Cl. 29-611.000.
Plastic Components, Inc.: *See—*
Failla, Stephen J.; and Perry, Raymond S., 4,288,016, Cl. 227-30.000.
Plester, Dietrich: *See—*
Heimke, Gunther; Plester, Dietrich; and Jahnke, Klaus, 4,287,616, Cl. 3-1.900.
Plug, Jan: *See—*
Kattenbroek, Hendrik J.; and Plug, Jan, 4,287,982, Cl. 198-706.000.
Plummer, Edward B. Storage container for magnetic tape cassettes. 4,287,989, Cl. 206-387.000.
Pneumatiques, Caoutchouc Manufacture et Plastiques: *See—*
Deck, Alphonse; and Lefaucheur, Claude, 4,287,924, Cl. 152-153.000.
Poetsch, Dieter, to Robert Bosch GmbH. Method and system to scan motion picture film to develop television signals. 4,288,818, Cl. 358-214.000.
Pohl, Walter J.; and Burns, Arthur L., to General Electric Company. Air conditioning control system with local and remote control capabilities. 4,287,939, Cl. 165-11.00R.
Polak's Frutal Works B.V.: *See—*
Nieuwland, Kees N.; and Kettenes, Dirk K., 4,288,350, Cl. 252-522.00R.
Polaroid Corporation: *See—*
Bilofsky, Ruth C.; and Rogers, Howard G., 4,288,524, Cl. 430-220.000.
Johnson, Bruce K., 4,288,153, Cl. 354-27.000.
Taylor, Lloyd D., 4,288,523, Cl. 430-215.000.
Poling, Ronald W., to General Electric Company. Snap-action member. 4,287,780, Cl. 74-100.00P.
Porta Systems Corp.: *See—*
Fasano, Michael, 4,288,660, Cl. 179-1.0PC.
Porter, Christopher H.; and Taylor, John A., to Extracorporeal Medical Specialites, Inc. Non-uniform cross-sectional area hollow fibers. 4,288,494, Cl. 428-398.000.
Poshkus, Gerald M., to Eastman Kodak Company. Instant film unit. 4,288,533, Cl. 430-496.000.
Poteet, Ronald L.: *See—*
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PPG Industries, Inc.: *See—*
Grove, William S., 4,288,243, Cl. 71-95.000.
Neely, James E., 4,288,252, Cl. 106-74.000.
Prager, Jay M.; Sadlow, Joseph F.; and Nitzsche, John K., to Gould Inc. Solid state device mounting and heat dissipating assembly. 4,288,839, Cl. 361-386.000.
Praglin, Julius: *See—*
Sielaff, Bruce H.; Praglin, Julius; McKie, James E., Jr.; Longhenry, David K.; Curtiss, Alan C.; and Bidwell, Charles B., 4,288,543, Cl. 435-34.000.
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Leandris, Sergio, 4,287,665, Cl. 29-705.000.
Press, Irving D., to Resistoflex Corporation. Pipe union with both pre-load dependent and independent seals. 4,288,105, Cl. 285-55.000.
Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See—*
Remington, Richard C., 4,287,732, Cl. 70-38.00C.
Price, Barry J.: *See—*
Judd, Duncan B.; Clitherow, John W.; Price, Barry J.; and Bradshaw, John, 4,288,443, Cl. 424-267.000.
Price, George M.: *See—*
Moore, Lewis F.; and Price, George M., 4,287,818, Cl. 99-355.000.
Priddy, Duane B., to Dow Chemical Company, The. Hydrocarbon polyl gem-bis(t-alkylperoxy)alkanoates derived from β-keto-acids. 4,288,379, Cl. 260-410.600.
Prilutsky, Anatoly N.: *See—*
Goncharov, Evgeny S.; Prilutsky, Anatoly N.; and Shevchuk, Viktor I., 4,287,779, Cl. 74-26.000.
Prince Industrial Development Co., Ltd.: *See—*
Yoshinaga, Sadao, 4,288,209, Cl. 431-255.000.
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Baker, Donald B., 4,288,459, Cl. 426-43.000.
Process Shizai Co., Ltd.: *See—*
Kashiwagi, Takashi, 4,288,509, Cl. 430-5.000.
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Tommaso, Helio, 4,288,685, Cl. 219-309.000.
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Pruett, Roy L.: *See—*
Billig, Ernst; Jamerson, Jackie D.; and Pruett, Roy L., 4,288,380, Cl. 260-429.00R.
Pryor, Michael J.; and Tyler, Derek E., to Olin Corporation. Continuous lubrication casting molds. 4,287,937, Cl. 164-418.000.
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Puccini, Richard E., to Texas Instruments Incorporated. Illuminated keyboard apparatus. 4,288,672, Cl. 200-314.000.
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Pullman Incorporated: *See—*
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Etzel, James E., 4,288,430, Cl. 424-153.000.
Quantel Limited: *See—*
Miles, Barry D. R., 4,288,815, Cl. 358-105.000.
Questor Corporation: *See—*
Cone, Richard E., 4,288,123, Cl. 297-154.000.
Quick, David C., to Allis-Chalmers Corporation. Hydraulic valve for two-speed power take-off drive. 4,287,778, Cl. 74-15.400.
Quick, Marshall K.: *See—*
Merola, Pasquale A.; and Quick, Marshall K., 4,288,858, Cl. 364-826.000.
R. E. Phelon Company, Inc.: *See—*
Burson, Bob O., 4,288,834, Cl. 361-256.000.
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Roder, Walter, 4,288,680, Cl. 219-121.0LG.
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Muller, Hanns P.; Rabe, Hansjurgen; and Wagner, Kuno, 4,288,566, Cl. 521-158.000.

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Eckstein, Wolfgang; and Rabenecker, Horst, 4,287,750, Cl. 73-1.00G.
Rabinovich, Georgy L.; Maslyansky, Gdal N.; Birjukova, Ljubov M.; Levitsky, Emmanuil A.; Volkova, Kira L.; Lukina, Zoya P.; and Mozhaiko, Viktor N. Novel catalyst for dealkylating alkyl benzenes and fractions of aromatized benzines by conversion with steam. 4,288,347, Cl. 252-439.000.
Raff, Paul: *See*—
Schuster, Ludwig; Raff, Paul; Hoffmann, Herwig; Schneider, Rolf; and Flickinger, Erich, 4,288,640, Cl. 568-855.000.
Rahm, Joseph A.; and Cole, Donald G., to NL Industries, Inc. Process for manufacturing titanium compounds using a reducing agent. 4,288,415, Cl. 423-82.000.
Rahm, Joseph A.; and Cole, Donald G., to NL Industries, Inc. Process for manufacturing titanium dioxide. 4,288,417, Cl. 423-83.000.
Rahm, Joseph A.: *See*—
Davis, Brian R.; and Rahm, Joseph A., 4,288,416, Cl. 423-82.000.
Davis, Brian R.; and Rahm, Joseph A., 4,288,418, Cl. 423-83.000.
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Baer, John S., 4,287,762, Cl. 73-170.00R.
Ramer, Paul C., to Alpine Research, Inc. Extensible ski poles with hand guard grip. 4,288,102, Cl. 280-823.000.
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Herchenbach, Horst; Ramesohl, Hubert; and Fleischer, Joachim, 4,288,213, Cl. 432-14.000.
Rampe, John F., to Rampe Research. Methods and apparatus for ductlessly distributing and circulating heated air from a gas-fired heater to heat large volumes of air in industrial facilities. 4,287,872, Cl. 126-110.00D.
Rampe Research: *See*—
Rampe, John F., 4,287,872, Cl. 126-110.00D.
Randklev, Ronald M.: *See*—
Anderson, Harvey L.; and Randklev, Ronald M., 4,288,355, Cl. 260-29.60M.
Rasmussen, Hans W., to Hulbert, Clarence E., Jr.; and Coburn, O. W. Method of recovering metallic tellurium. 4,288,423, Cl. 423-510.000.
Rauen, John T. Power transmission. 4,287,863, Cl. 123-432.000.
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Copenhafer, William C.; and Rauh, Francis, 4,288,419, Cl. 423-190.000.
Rauhut, Michael M.; and Tseng, Shin-Shyong, to American Cyanamid Company. Process for preparing amides by reaction in presence of molecular sieve. 4,288,592, Cl. 544-159.000.
Ray-O-Vac Corporation: *See*—
Joshi, Ashok V.; and Sholette, William P., 4,288,505, Cl. 429-191.000.
Raybestos-Manhattan, Inc.: *See*—
Inman, Hubert W., 4,288,058, Cl. 249-134.000.
RCA Corporation: *See*—
Carter, George W., 4,288,875, Cl. 455-197.000.
Hernqvist, Karl G., 4,288,719, Cl. 313-457.000.
Mindel, Michael J.; Miller, Michael E.; Rustman, James C.; and Palmer, Richard C., 4,287,689, Cl. 51-320.000.
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Rhodes, Roland N., 4,288,812, Cl. 358-44.000.
Re, Luciano; Brant, Alberto; and Bassignani, Luciano, to Snamprogetti, S.p.A. Method of preparation of 5,6-dehydropenicillins. 4,288,366, Cl. 260-245.20R.
Rea, James H.: *See*—
Karim, Khalid A.; and Rea, James H., 4,288,572, Cl. 525-176.000.
Karim, Khalid A.; and Rea, James H., 4,288,573, Cl. 525-177.000.
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Recognition Equipment Incorporated: *See*—
Sanner, Medford D., 4,288,690, Cl. 250-216.000.
Redikultsev, Jury V.; Gorbunov, Oleg P.; and Lomakin, Alexandr M. Apparatus for automatically stabilizing a process of thermal treatment of liquid media. 4,288,404, Cl. 422-107.000.
Redmon, David T.: *See*—
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Ewing, Lloyd; Redmon, David T.; and Roche, William H., 4,288,395, Cl. 261-122.000.
Reese, Edmund A.; White, Lionel S., Jr.; and McAlexander, Joseph C., III, to Texas Instruments Incorporated. Noise immunity in input buffer circuit for semiconductor memory. 4,288,706, Cl. 307-577.000.
Reibetanz, Wilbert: *See*—
Wanner, Karl; Reibetanz, Wilbert; Dohse, Hans-Peter; Baumann, Otto; Spiwokz, Dietmar; Seitz, Karl; Angermair, Ernst; and Wiesner, Herbert, 4,288,187, Cl. 409-180.000.
Reichhold Chemicals, Inc.: *See*—
Amundsen, Joseph; Goodwin, Robert J.; and Wetzel, William H., 4,288,249, Cl. 106-18.350.
Reidelbach, Willi; Renner, Hermann; and Klie, Wolfgang, to Daimler-Benz Aktiengesellschaft. Hollow bearer for vehicles and method for its manufacture. 4,288,025, Cl. 228-173.00F.
Reiss, Andre. Stable diazonium salt generator for improved marijuana analysis. 4,288,344, Cl. 252-408.000.
Remington, Richard C., to Presto Lock Company, Division of Walter Kidde & Company, Inc. Padlock. 4,287,732, Cl. 70-38.00C.
Remond, Georges: *See*—
Vincent, Michel; Duhault, Jacques; Boullanger, Michelle; and Remond, Georges, 4,288,453, Cl. 424-317.000.
Renner, Hermann: *See*—
Reidelbach, Willi; Renner, Hermann; and Klie, Wolfgang, 4,288,025, Cl. 228-173.00F.
Rennick, Lyle V.: *See*—
Bader, Ronald S.; Rennick, Lyle V.; and Wallis, Robert H., 4,288,782, Cl. 340-146.30Q.
Republic Steel Corporation: *See*—
Toth, James M., 4,288,164, Cl. 356-445.000.
Research Corporation: *See*—
Johnson, Francis; and Kim, Kyoung S., 4,288,608, Cl. 560-53.000.
Stevens, Roy W., 4,288,426, Cl. 424-1.000.
Research, Development & Marketing: *See*—
Nelson, John R., 4,287,922, Cl. 145-32.00R.
Resistoflex Corporation: *See*—
Press, Irving D., 4,288,105, Cl. 285-55.000.
Retech, Inc.: *See*—
Schlienger, Max P., 4,288,116, Cl. 285-364.000.
Reusser, Robert E.; and Jones, Brenton E., to Phillips Petroleum Company. Silicone polymer-based release coating agents having organic titanates as stabilizers and tapes. 4,288,496, Cl. 428-447.000.
Rex Industries Co., Ltd.: *See*—
Sakaguchi, Ryo; and Ikenaka, Yoshiharu, 4,288,181, Cl. 408-15.000.
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Meyers, George L.; Seiden, Frederick C.; and Waller, Lonnie J., 4,287,704, Cl. 53-564.000.
Reynders, John R.: *See*—
Grotjohann, Hermanus H.; and Reynders, John R., 4,288,868, Cl. 370-30.000.
Reynolds, James E.; and Williams, Alan R., to Public Service Company of New Mexico. Process for chlorinating clays and bauxite. 4,288,414, Cl. 423-79.000.
Reynolds Metals Company: *See*—
Mansfield, Thomas L., 4,287,755, Cl. 73-61.00R.
Rhee, Jhoon G. Protective device with shape developing and securing member. 4,287,610, Cl. 2-18.000.
Rhodes, Roland N., to RCA Corporation. Color filter. 4,288,812, Cl. 358-44.000.
Rhone-Poulenc Industries: *See*—
Belloc, Andre; Florent, Jean; Lunel, Jean; Palla, Jean-Claude; and Mancy, Denise, 4,288,556, Cl. 435-265.000.
Soula, Gerard; and Linguenheld, Louis, 4,288,386, Cl. 260-465.00F.
Riccard, Theodore M. Ventilator shroud. 4,287,816, Cl. 98-119.000.
Richard, Joseph D. Apparatus for concentrating and sampling substances from seawater. 4,287,763, Cl. 73-863.210.
Richards, Frederick T.: *See*—
Vazquez-Cuervo, Alfonso; Richards, Frederick T.; Bafunno, Daniel V.; and Papacostas, George, 4,288,726, Cl. 318-54.000.
Richards Manufacturing Company, Inc.: *See*—
Treace, Harry T., 4,288,066, Cl. 269-270.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Bajusz, Sandor; Ronay, Andras; and Szekely, Jozsef, 4,288,432, Cl. 424-177.000.
Richtzenhain, Hermann: *See*—
Bier, Gerhard; Kottek, Dagmar; Petersen, Egon N.; Richtzenhain, Hermann; and Vollkommer, Norbert, 4,288,607, Cl. 560-11.000.
Richwine, John R., to Hercules Incorporated. 2,5-Dimercapto-1,3,4-thiadiazole as a cross-linker for saturated, halogen-containing polymers. 4,288,576, Cl. 525-349.000.
Ricoh Co., Ltd.: *See*—
Hashimoto, Hideo; and Kaneda, Tokuzo, 4,288,068, Cl. 271-125.000.
Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyohachiro; and Kodama, Yutaka, 4,288,797, Cl. 346-75.000.
Yamada, Kunihiro, 4,288,874, Cl. 375-118.000.
Riddell, Inc.: *See*—
Schulz, Arthur M., 4,287,613, Cl. 2-413.000.
Riedner, Robert J.: *See*—
Banski, Thomas J.; and Riedner, Robert J., 4,288,246, Cl. 75-68.00R.
Rines, Robert H.; and Knowles, Albert. Fish growth acceleration and density-increasing apparatus and method. 4,287,852, Cl. 119-3.000.
Rion Co., Ltd.: *See*—
Hori, Kiyoharu, 4,287,895, Cl. 128-777.000.
Ripley, William C.: *See*—
Osborne, Gregory W.; Ripley, William C.; and Wilson, Robert E., 4,288,794, Cl. 343-708.000.
Rittscher, Dieter: *See*—
Baatz, Henning; Rittscher, Dieter; and Fischer, Jurgen, 4,288,698, Cl. 250-506.000.
Rivier, Georges, to Orogil. Novel metallic dithiophosphates and their use as additives for lubricating oils. 4,288,335, Cl. 252-32.70E.
Roanwell Corporation: *See*—
Foley, James P., 4,288,663, Cl. 179-122.000.
Roark, Charles F. Water heating system using solar energy. 4,287,879, Cl. 126-437.000.
Robert Bosch GmbH: *See*—
Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; Kunz, Johann; Lemke, Werner; and Sohnle, Rudiger, 4,288,711, Cl. 310-68.00D.
Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; and Sohnle, Rudiger, 4,288,712, Cl. 310-91.000.
Leiber, Heinz; Jonner, Wolf-Dieter; and Goebels, Hermann-Josef, 4,288,127, Cl. 303-111.000.
Poetsch, Dieter, 4,288,818, Cl. 358-214.000.
Schelhas, Peter, 4,288,037, Cl. 239-434.500.

Wanner, Karl; Reibetanz, Wilbert; Dohse, Hans-Peter; Baumann, Otto; Spiwokz, Dietmar; Seitz, Karl; Angermair, Ernst; and Wiesner, Herbert, 4,288,187, Cl. 409-180.000.

Roberts, Norman L.; and Whittaker, Graham, to Imperial Chemical Industries Limited. Preparation of 2-chloro-5-trifluoromethylpyridine and 2-chloro-5-perchlorofluoromethylpyridines. 4,288,600, Cl. 546-345.000.

Robichaud, Eileen. Nail form device. 4,287,899, Cl. 132-73.000.

Robinson, Michael, to LaPorte Industries Limited. Electrical insulation device. 4,288,650, Cl. 13-2.00P.

Robison, Harry I. Chemical heat pump and method. 4,287,721, Cl. 62-94.000.

Roche, William H.: *See*—
Ewing, Lloyd; Redmon, David T.; Thayer, Paul M.; Schmit, Frank L.; and Roche, William H., 4,288,394, Cl. 261-122.000.
Ewing, Lloyd; Redmon, David T.; and Roche, William H., 4,288,395, Cl. 261-122.000.

Rockwell International Corporation: *See*—
Flanagan, Joseph E.; and Gray, John C., 4,288,262, Cl. 149-19.600.
Kumar, Arun, 4,287,740, Cl. 72-40.000.

Roder, Walter, to R + S Stanzformen GmbH. Apparatus for cutting mould notches for strip steel cutting tools. 4,288,680, Cl. 219-121.0LG.

Rodermund, Gerd; and Kappus, Helmut. Process and apparatus for making pompons. 4,287,647, Cl. 28-147.000.

Rody, Jean, to Ciba-Geigy Corporation. Polyalkylpiperidine derivatives of s-triazines. 4,288,593, Cl. 544-198.000.

Rogachev, Nikolai V.: *See*—
Arutjunian, Norair S.; Arisheva, Evgenia A.; Rogachev, Nikolai V.; and Vasilievna, Lidia G., 4,288,377, Cl. 260-397.250.

Rogan, John B.; and Buehler, Charles K., to Standard Oil Company (Indiana). Catalyst and process for the polymerization of alpha-olefins. 4,288,580, Cl. 526-138.000.

Rogers, Dan C.; and Maggio, Joseph A., to M.R.E. Enterprises, Inc. Structure for holding a reservoir in an inverted position for gravity dispensing of a liquid. 4,288,007, Cl. 222-66.000.

Rogers, Howard G.: *See*—
Bilofsky, Ruth C.; and Rogers, Howard G., 4,288,524, Cl. 430-220.000.

Rogers, Jerrold J.; and Durecka, John, to Tektronix, Inc. Dual-mode amplifier. 4,288,738, Cl. 323-271.000.

Rogers, Olbert W. Method and apparatus for electroplating or electroforming metal objects. 4,288,298, Cl. 204-4.000.

Rogers, Wesley A.; and Laggan, James J., to General Motors Corporation. Electrostatic alpha-numeric display. 4,288,788, Cl. 340-378.200.

Rohm and Haas Company: *See*—
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Rohringer, Peter: *See*—
Nachbur, Hermann; and Rohringer, Peter, 4,288,489, Cl. 428-265.000.

Roland, Wolf-Achim; and Bechstedt, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Fluid, cold-stable, two-component washing compositions and method of washing textiles. 4,288,225, Cl. 8-137.000.

Roldness, David J.; Galasan, Felixberto A.; and Watson, Thomas H., to Pullman Incorporated. Auto carrier railway car. 4,287,833, Cl. 105-378.000.

Roles, David J.: *See*—
Znamirowski, Henry; and Roles, David J., 4,288,132, Cl. 312-257.00R.

Rolf, Meinhard; Neeff, Rutger; and Muller, Walter, to Bayer Aktiengesellschaft. Monoazo pigments containing a quinazolinonylacetoacetanilide coupling component. 4,288,362, Cl. 260-154.000.

Rolfe, Keith O.; and Smith, Clifford E. Container for transported goods. 4,287,997, Cl. 220-1.500.

Rolls-Royce Limited: *See*—
Bennett, George H.; Osborn, Alfred W.; Bunyan, Clive N.; and Midgley, Ronald A., 4,287,913, Cl. 137-574.000.

Romagnoli, Andrea, to IMA - Industria Macchine Automatiche S.p.A. Apparatus for securing a suspension thread to filter bags for infusion products. 4,288,224, Cl. 493-345.000.

Romhild, Werner, to Tidland GmbH. Device for controlling the tension of a web. 4,288,045, Cl. 242-75.530.

Ronay, Andras: *See*—
Bajusz, Sandor; Ronay, Andras; and Szekely, Jozsef, 4,288,432, Cl. 424-177.000.

Ronen, Ram S., to Xerox Corporation. Monolithic HVMOSFET active switch array. 4,288,801, Cl. 357-41.000.

Ronen, Ram S., to Xerox Corporation. HVMOSFET Driver with single-poly gate structure. 4,288,802, Cl. 357-41.000.

Ronen, Ram S., to Xerox Corporation. High voltage MOSFET with doped ring structure. 4,288,803, Cl. 357-41.000.

Ronen, Ram S., to Xerox Corporation. High voltage MOSFET with overlapping electrode structure. 4,288,806, Cl. 357-45.000.

Roorda, Herm J.; and Jipping, Max J., to Akzo NV. Process for producing agglomerates of metal containing ores and the product of the process. 4,288,245, Cl. 75-0.50R.

Roper Corporation: *See*—
Znamirowski, Henry; and Roles, David J., 4,288,132, Cl. 312-257.00R.

Roquette Freres: *See*—
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Rose, Benjamin L., Jr.: *See*—
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Rose, Scott D.: *See*—
Rose, William A.; and Rose, Scott D., 4,288,077, Cl. 273-246.000.

Rose, William A.; and Rose, Scott D. Horse race lottery game. 4,288,077, Cl. 273-246.000.

Rosen, Brian: *See*—
Thornburg, David D.; and Rosen, Brian, 4,288,836, Cl. 361-288.000.

Rosenberg, Avner. Fluid flow control device particularly useful as a drip-irrigation emitter. 4,288,035, Cl. 239-271.000.

Rosner, Manfred, to Ciba-Geigy AG. Process for the production of 4-acylamido-2-nitro-1-alkoxybenzenes. 4,288,620, Cl. 564-144.000.

Ross, Carl H.: *See*—
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Rossi, Alberto: *See*—
Haas, Georges; Rossi, Alberto; Jaeggi, Knut A.; and Sele, Alex, 4,288,450, Cl. 424-283.000.

Rostron, Joseph R.: *See*—
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Rothmans of Pall Mall Canada Limited: *See*—
Brackmann, Warren A.; and Kuhner, Albert, 4,287,897, Cl. 131-303.000.

Rotoflow Corporation, Inc.: *See*—
Swearingen, Judson S., 4,287,758, Cl. 73-862.490.

Rotor Tool Company, The: *See*—
Curtiss, George R., 4,287,795, Cl. 81-57.260.

Rotork Limited: *See*—
Smith, Frederick A., 4,288,665, Cl. 200-18.000.

Rotovolumetric AG: *See*—
Lotscher, Bernhard, 4,288,793, Cl. 340-870.370.

Rotta Research Laboratorium S.p.A.: *See*—
Rovati, Luigi; Makovec, Francesco; and Senin, Paolo, 4,288,609, Cl. 560-117.000.

Rottmaier, Ludwig; Merten, Rudolf; Dhein, Rolf; and Kreuder, Hans J., to Bayer Aktiengesellschaft. Power lacquer binders and process for the preparation thereof. 4,288,569, Cl. 525-113.000.

Roussel Uclaf: *See*—
Heymes, Rene, 4,288,434, Cl. 424-246.000.

Rovati, Luigi; Makovec, Francesco; and Senin, Paolo, to Rotta Research Laboratorium S.p.A. Quaternary ammonium derivatives of adamantane with antimicrobic activity. 4,288,609, Cl. 560-117.000.

Rovin, Herman. Apparatus for cutting and hemming bed sheets and the like. 4,287,841, Cl. 112-121.110.

RSV-Gusto Engineering B.V.: *See*—
Schoonmade, Wim, 4,288,177, Cl. 405-196.000.

Ruchel, Peter, to Diehl GmbH & Co. Brass material and a process for the preparation thereof. 4,288,257, Cl. 148-11.50C.

Rudd, Wallace C.: *See*—
Oppenheimer, Edgar D.; Udall, Humfrey N.; and Rudd, Wallace C., 4,287,947, Cl. 165-183.000.

Ruhrchemie Aktiengesellschaft: *See*—
Konrad, Klaus-Dieter; Kellersohn, Rudolf; Steck, Hans; and Schaub, Josef, 4,288,266, Cl. 156-158.000.
Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, 4,288,643, Cl. 585-324.000.

Rumanowski, Edmund J., to Stauffer Chemical Company. Purification of pyrethroid intermediate compounds by selective partial saponification. 4,288,610, Cl. 560-124.000.

Ruschek, Gerhard, to VDO Adolf Schindling AG. Electric regulating device. 4,287,782, Cl. 74-405.000.

Rushansky, Yuliy: *See*—
Moskowitz, Paul M.; Rushansky, Yuliy; Brown, Lester; and Weinstein, Gerald, 4,287,817, Cl. 99-282.000.

Russell, David B., to Dennison Manufacturing Company. Method and apparatus for dispensing fasteners. 4,288,017, Cl. 227-67.000.

Rustman, James C.: *See*—
Mindel, Michael J.; Miller, Michael E.; Rustman, James C.; and Palmer, Richard C., 4,287,689, Cl. 51-320.000.

Ryanen, Robert M., to Federal-Mogul Corporation. Bearing cage. 4,288,129, Cl. 308-218.000.

Rye, Grover W.: *See*—
Caravito, Vito A.; and Rye, Grover W., 4,287,927, Cl. 152-302.000.

Ryobi, Ltd.: *See*—
Morimoto, Yoshinori; and Kobayashi, Takehiro, 4,288,046, Cl. 242-84.21R.

S.A.R.L. Laporte Cibelec: *See*—
Laporte, Jean C.; and Laporte, Jean M., 4,288,080, Cl. 273-406.000.

Saab-Scania Aktiebolag: *See*—
Cedendahl, Bengt E., 4,287,784, Cl. 74-473.00R.

SAB Industri AB: *See*—
Stensson, Bo G.; Harstrom, Jan O.; and Csiba, Jan, 4,287,968, Cl. 188-74.000.

Sacco, Marian E.: *See*—
Groman, Ernest V.; and Sacco, Marian E., 4,288,538, Cl. 435-7.000.

Sachs Systemtechnik GmbH: *See*—
Brunken, Gerd; and Stangl, Rupert, 4,287,735, Cl. 70-395.000.

Sackman, George L., to United States of America, Navy. Ultrasonic image system. 4,288,866, Cl. 367-11.000.

Sadanandan, Kunissery P.: *See*—
Pacharis, George H.; and Sadanandan, Kunissery P., 4,287,807, Cl. 411-42.000.

Sadlow, Joseph F.: *See*—
Prager, Jay M.; Sadlow, Joseph F.; and Nitzsche, John K., 4,288,839, Cl. 361-386.000.

Sado, Ichiro; Kishimoto, Juji; and Murata, Hiroshi, to Canon Kabushiki Kaisha. Electronic apparatus with time-division drive. 4,288,792, Cl. 340-756.000.

Sado, Ryoichi, to Shin-Etsu Polymer Company, Ltd. Gaskets for electric shielding. 4,288,081, Cl. 277-1.000.

Saegusa, Nobuaki: *See*—
Sakaki, Masakatsu; and Saegusa, Nobuaki, 4,287,976, Cl. 192-84.00C.

Saima, Tooru; Ohya, Isao; Imada, Takahiko; Sato, Hideo; and Katsuma, Shinichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for exchanging control rod drive mechanism in a nuclear reactor. 4,288,290, Cl. 176-19.00R.

Sainsbury, Arthur W., Jr. Curtain and window shade hardware. 4,288,057, Cl. 248-546.000.

Saint-Gobain Industries: *See*—
Battigelli, Jean A.; and Bouquet, Francois, 4,288,236, Cl. 65-14.000.
Battigelli, Jean A.; Bouquet, Francois; and Fezenko, Igor, 4,288,237, Cl. 65-14.000.
Delcoigne, Adrien; and Lanneau, Jacques, 4,288,263, Cl. 156-42.000.

Saintemarie, Pierre M.: *See*—
Amblard, Jean-Louis; and Saintemarie, Pierre M., 4,288,008, Cl. 222-281.000.

Saito, Minoru: *See*—
Kutsuwada, Noboru; Saito, Minoru; Namiki, Ryoichi; and Kusunoki, Katsuo, 4,288,514, Cl. 430-54.000.

Saito, Mitsuaki: *See*—
Tanji, Hiroaki; Saito, Mitsuaki; and Ishii, Masaji, 4,288,717, Cl. 313-336.000.

Saito, Tadao: *See*—
Kinoshita, Harumi; Hayashi, Yoshiaki; and Saito, Tadao, 4,288,478, Cl. 428-35.000.

Saito, Taiichi: *See*—
Otsu, Nobuyuki; Mori, Shunji; and Saito, Taiichi, 4,288,779, Cl. 340-146.30Y.

Saito, Tsutomu: *See*—
Takami, Akio; Matsuura, Toshitaka; and Saito, Tsutomu, 4,288,774, Cl. 338-34.000.

Saji, Ikutaro; Aono, Shunji; Okuda, Takao; and Agui, Hideo, to Sumitomo Chemical Company, Limited. N-Substituted imidazole derivatives, and their use. 4,288,448, Cl. 424-273.00R.

Sakaguchi, Ryo; and Ikenaka, Yoshiharu, to Rex Industries Co., Ltd. Die-head of cutting machines. 4,288,181, Cl. 408-15.000.

Sakai, Kazumasa, to TRIO Kabushiki Kaisha. Protective circuit for a direct-coupled amplifier. 4,288,755, Cl. 330-298.000.

Sakaki, Masakatsu; and Saegusa, Nobuaki, to Sankyo Electric Company Limited. Electromagnetic clutches. 4,287,976, Cl. 192-84.00C.

Sakakibara, Tadamori; Matsushima, Yoshihisa; Nagashima, Yukio; Okamoto, Nobukazu; Kaneko, Katsumi; Ishii, Yohio; and Wada, Shozo, to Toa Nenryo Kogyo Kabushiki Kaisha. Novel rhodium compounds and process for producing the same. 4,288,634, Cl. 568-454.000.

Sakakima, Hiroshi: *See*—
Senno, Harufumi; Sakakima, Hiroshi; Yanagiuchi, Yukihiro; Inoue, Tsuneo; Yamaguchi, Masatsugu; and Hirota, Eiichi, 4,288,260, Cl. 148-121.000.

Sakamoto, Yoshiyasu; Tamura, Yoichi; Kawaguchi, Kiyohiko; and Inada, Kiyotaka, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Measuring particle size distribution. 4,288,162, Cl. 356-335.000.

Sakata, Shinji; Yokota, Hirakazu; Shimizu, Tasuku; and Otawara, Yasuhiko, to Hitachi, Ltd. Welding method of turbine diaphragm. 4,288,677, Cl. 219-121.0ED.

Sakata, Yoshiya: *See*—
Katou, Hisao; and Sakata, Yoshiya, 4,288,684, Cl. 219-295.000.

Sakuma, Noboru: *See*—
Ota, Hiroshi; Sakuma, Noboru; Takarabe, Takeki; and Takiguchi, Isao, 4,288,337, Cl. 252-512.000.

Sakurada, Nobuaki; Shinoda, Nobuhiko; Mashimo, Yukio; Ito, Tadashi; and Ito, Fumio, to Canon Kabushiki Kaisha. Digital information indicating system. 4,288,154, Cl. 354-23.00D.

Salazar, Maria V. Weight reducing belt. 4,287,893, Cl. 128-556.000.

Saligny, Yves, to Etablissements Carpano & Pons. Two-section protection module for connecting blocks. 4,288,832, Cl. 361-119.000.

Saller, Erik, to FMC Corporation. Form coke production with recovery of medium BTU gas. 4,288,293, Cl. 201-6.000.

Salton, Inc.: *See*—
Moskowitz, Paul M.; Rushansky, Yuliy; Brown, Lester; and Weinstein, Gerald, 4,287,817, Cl. 99-282.000.

Sandoz Ltd.: *See*—
Gertisser, Berthold; and Henzi, Beat, 4,288,227, Cl. 8-655.000.
Traber, Rene P.; Hofmann, Hans; Harri, Eugen; and Max, Kuhn, 4,288,431, Cl. 424-177.000.

Sanford, Robert B. Canister set. 4,287,921, Cl. 141-360.000.

Sankyo Electric Company Limited: *See*—
Sakaki, Masakatsu; and Saegusa, Nobuaki, 4,287,976, Cl. 192-84.00C.

Sanner, Medford D., to Recognition Equipment Incorporated. Illumination system. 4,288,690, Cl. 250-216.000.

Sanner, Sidney N. Sailboat having multiple hulls. 4,287,845, Cl. 114-39.000.

Sano, Takezo; Inoue, Haruo; and Furuta, Akihiro, to Sumitomo Chemical Company Limited. Use of photo-curable composite materials to make a stencil. 4,288,529, Cl. 430-308.000.

Sanscord Australia Pty. Limited: *See*—
Perkins, Rex H., 4,287,967, Cl. 187-24.000.

Sarkisian, Robert. Adjustable sign mounting bracket. 4,288,053, Cl. 248-218.400.

Sasaki, Shunsuke: *See*—
Konishikawa, Kaoru; Sasaki, Shunsuke; Higuchi, Kouichi; and Hirose, Fuminori, 4,288,840, Cl. 361-410.000.

Sato, Hideo: *See*—
Saima, Tooru; Ohya, Isao; Imada, Takahiko; Sato, Hideo; and Katsuma, Shinichi, 4,288,290, Cl. 176-19.00R.

Sato, Masaaki, to Olympus Optical Company Limited. Pad device for use in tape cassette. 4,288,826, Cl. 360-130.330.

Sato, Masaaki, to Olympus Optical Company Ltd. Automatic switching device for cassette tape recorder with low frequency compensating means. 4,288,827, Cl. 360-137.000.

Sato, Yasuo: *See*—
Yoshida, Ikio; Kage, Kouzou; Ikeda, Kazuhiro; and Sato, Yasuo, 4,288,751, Cl. 328-173.000.

Saulnier, Charly J., to Parker-Hannifin Corporation. Quick connector coupling for semi-rigid hose. 4,288,113, Cl. 285-238.000.

Savage, David H. Carrier for sheet of photographic paper. 4,288,156, Cl. 354-312.000.

Scartazzini, Riccardo: *See*—
Schaffner, Karl; Wehrli, Hansuli; Muller, Beat; and Scartazzini, Riccardo, 4,288,364, Cl. 260-239.00A.

Schaeffer, David J.: *See*—
Tigwell, David C.; and Schaeffer, David J., 4,288,206, Cl. 417-517.000.

Schaffner, Karl; Wehrli, Hansuli; Muller, Beat; and Scartazzini, Riccardo, to Ciba-Geigy Corporation. Fragmentation procedure for preparing 3-amino-azetidinones. 4,288,364, Cl. 260-239.00A.

Schaffter, Craig P.: *See*—
McDonald, John C.; Baichtal, James R.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig P., 4,288,870, Cl. 370-56.000.

Schamber, Frederick H.; and McCarthy, Jon J., to Tracor Northern, Inc. Beam current normalization in an X-ray microanalysis instrument. 4,288,692, Cl. 250-310.000.

Schaub, Josef: *See*—
Konrad, Klaus-Dieter; Kellersohn, Rudolf; Steck, Hans; and Schaub, Josef, 4,288,266, Cl. 156-158.000.

Schaumann, Wolfgang: *See*—
Friebe, Walter-Gunar; Michel, Helmut; Ross, Carl H.; Wiedemann, Fritz; Sponer, Gisbert; and Schaumann, Wolfgang, 4,288,442, Cl. 424-267.000.

Scheck, Gerald W.: *See*—
Brown, Lawrence E.; Bauer, James L.; and Scheck, Gerald W., 4,288,282, Cl. 156-630.000.

Schelhas, Peter, to Robert Bosch GmbH. Fuel injection valve. 4,288,037, Cl. 239-434.500.

Schiff, Charles M. Retracting arrow rest. 4,287,868, Cl. 124-41.00A.

Schiff, Peter. Cannula for intra-aortic balloon devices and the like. 4,287,892, Cl. 128-349.00B.

Schlegel Corporation: *See*—
Beck, Frank W., 4,288,482, Cl. 428-92.000.
Miska, Stanley R.; and Boyce, Jay E., 4,288,483, Cl. 428-92.000.

Schlienger, Max P., to Retech, Inc. Apparatus for fastening flanged tubular members. 4,288,116, Cl. 285-364.000.

Schloemann-Siemag, Inc.: *See*—
Fuhrmann, Wilhelm; and Sofranko, Andrew J., 4,287,745, Cl. 72-248.000.

Schmid, Frederick, to Crystal Systems Inc. Charging system for cutting blade. 4,287,869, Cl. 125-16.00R.

Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius, to Sulzer Morat GmbH. Thread guidance in mesh-forming machines with rotating thread guides. 4,287,728, Cl. 66-125.00R.

Schmid, Rolf: *See*—
Lohse, Friedrich; Gutekunst, Ferdinand; Schmid, Rolf; and Schmitter, Andre, 4,288,565, Cl. 521-135.000.

Schmidt, Friedrich W.: *See*—
Hoffman, Luther A.; and Schmidt, Friedrich W., 4,287,987, Cl. 206-63.300.

Schmidt, Hans-Joachim; Wunder, Friedrich; Arpe, Hans-Jurgen; and Leupold, Ernst I., to Hoechst Aktiengesellschaft. Process for the manufacture of oxygen-containing carbon compounds from synthesis gas. 4,288,558, Cl. 518-716.000.

Schmidt, Kenneth J., to General Trailer Company, Inc. Vehicle suspension with flexible transversal beam. 4,287,958, Cl. 177-136.000.

Schmit, Frank L.: *See*—
Ewing, Lloyd; Redmon, David T.; Thayer, Paul M.; Schmit, Frank L.; and Roche, William H., 4,288,394, Cl. 261-122.000.

Schmitter, Andre: *See*—
Lohse, Friedrich; Gutekunst, Ferdinand; Schmid, Rolf; and Schmitter, Andre, 4,288,565, Cl. 521-135.000.

Schmolka, Irving R.; and Niu, Joseph H. Y., to BASF Wyandotte Corporation. Ester containing fuel composition. 4,288,232, Cl. 44-51.000.

Schneebeli, Friedrich; and Biondetti, Mario, to Escher Wyss Limited. Large diameter hydroelectric machine. 4,288,703, Cl. 290-52.000.

Schneider, Abraham: *See*—
Janoski, Edward J.; Schneider, Abraham; and Ware, Richard E., 4,288,644, Cl. 585-360.000.

Schneider, Hans, to Sulzer Brothers Limited. Process for the precision molding of castings. 4,287,932, Cl. 164-516.000.

Schneider, Manfred: *See*—
Geiger, Michael; Schneider, Manfred; and Lutzkendorf, Jorg, 4,288,192, Cl. 414-223.000.

Schneider, Rolf: *See*—
Schuster, Ludwig; Raff, Paul; Hoffmann, Herwig; Schneider, Rolf; and Flickinger, Erich, 4,288,640, Cl. 568-855.000.

Schnell, Walter, to Cerberus AG. Fire alarm. 4,288,790, Cl. 340-628.000.

Schnellbacher, Kurt: *See*—
Essmann, Wolfgang; and Schnellbacher, Kurt, 4,288,318, Cl. 209-139.00R.

Schnitzer, Leo. Burner-boiler combination and an improved burner construction therefor. 4,287,857, Cl. 122-23.000.

Schoen, Roy C.: *See*—
Milbrandt, Carlton A.; and Schoen, Roy C., 4,288,666, Cl. 200-47.000.

Schoennagel, Hans J., to Mobil Oil Corporation. Separately supported polymetallic reforming catalyst. 4,288,348, Cl. 252-441.000.

Schoonmade, Wim, to RSV-Gusto Engineering B.V. Walking platform construction. 4,288,177, Cl. 405-196.000.

Schroder, Gerhard; and Feucht, Fritz, to Vereinigte Baubeschlagfabriken Gretsch and Co., GmbH. Door closer mounting arrangement. 4,288,054, Cl. 248-225.100.

Schroeder, Walter W., to Sprague Electric Company. Capacitor construction with self-locking closure. 4,288,843, Cl. 361-433.000.

Schrotz, Kurt; and Becker, Werner, to Esselte Pendaflex Corporation. Hand-held label printing, dispensing and applying apparatus. 4,288,276, Cl. 156-384.000.

Schucht, Peter: *See*—
Beyer, Franz; and Schucht, Peter. 4,288,760, Cl. 333-116.000.

Schuck, Joseph J.: *See*—
Godlewski, Irene T.; Schuck, Joseph J.; and Chisarik, Andrew S., 4,288,327, Cl. 210-698.000.

Schulz, Arthur M., to Riddell, Inc. Headgear with energy absorbing and sizing means. 4,287,613, Cl. 2-413.000.

Schulz, Eckhard: *See*—
Eckel, Wolf-Dietrich; and Schulz, Eckhard, 4,288,353, Cl. 260-28.00R.

Schumann, George; and Beckstead, Jerry, to Energy Research International. Zero clearance mobile home fireplace unit. 4,287,871, Cl. 126-67.000.

Schuster, Hans-Dieter; Jans, Karl; and Ohlendorf, Rolf, to Daimler-Benz Aktiengesellschaft. Exhaust gas system for internal combustion engines. 4,287,716, Cl. 60-276.000.

Schuster, Ludwig; Raff, Paul; Hoffmann, Herwig; Schneider, Rolf; and Flickinger, Erich, to BASF Aktiengesellschaft. Carrying out exothermic reactions between a gas and a liquid. 4,288,640, Cl. 568-855.000.

Schwartze, Hansjurgen, to Kabel- und Metallwerke Gutehoffnungshutte A.G. Termination construction of a cable comprised of bundled tubes. 4,288,107, Cl. 285-137.00R.

Schwarz, Gunter. Irrigating appliance for female hygiene. 4,287,888, Cl. 128-239.000.

Schwarz, Gunter. Adhesive connection of a body having a base plate with a ski. 4,288,099, Cl. 280-817.000.

Schweitzer, Edmund O. Fault indicator operable from a remote excitation source through a uniformly distributed impedance cable. 4,288,743, Cl. 324-127.000.

Schweizerische Lokomotive-und Maschinenfabrik: *See*—
Kreissig, Ernst; and Steinmann, Friedrich, 4,287,832, Cl. 105-176.000.

Science Union et Cie: *See*—
Vincent, Michel; Duhault, Jacques; Boullanger, Michelle; and Remond, Georges, 4,288,453, Cl. 424-317.000.

Scopelianos, Angelo G.: *See*—
United States of America, National Aeronautics and Space Administration; Allcock, Harry R.; O'Brien, John P.; Scopelianos, Angelo G.; and Fewell, Larry L., 4,288,585, Cl. 528-4.000.

Scott, Douglas C. Combination heat reclaim and air conditioning coil system. 4,287,722, Cl. 62-200.000.

Scott, George B. Base for free standing merchandiser. 4,288,052, Cl. 248-188.600.

Scott, Howard L.: *See*—
McClain, James E.; and Scott, Howard L., 4,288,737, Cl. 323-254.000.

Scott Paper Company: *See*—
Grzywinski, Gerald G.; and Foley, Edward J., 4,288,480, Cl. 428-40.000.

Scovill Inc.: *See*—
Denton, Arthur M., 4,287,639, Cl. 16-48.500.

Scribner, Herbert C., Jr., to Collagen Corporation. Method of making leather fiber insulation by drying-case hardening and product thereof. 4,288,498, Cl. 428-473.000.

Searle, Robert J. G.: *See*—
Day, Janet A.; and Searle, Robert J. G., 4,288,367, Cl. 260-326.270.

Searles, Kenneth R.: *See*—
Searles, William K.; Searles, Richard J.; and Searles, Kenneth R., 4,288,020, Cl. 228-7.000.

Searles, Richard J.: *See*—
Searles, William K.; Searles, Richard J.; and Searles, Kenneth R., 4,288,020, Cl. 228-7.000.

Searles, William K.; Searles, Richard J.; and Searles, Kenneth R., to Babcock & Wilcox Company, The. Tracking type welding apparatus. 4,288,020, Cl. 228-7.000.

Sedenquist, Edward M.: *See*—
Finsness, Wilma L.; McMonagle, Richard I.; and Sedenquist, Edward M., 4,288,845, Cl. 362-63.000.

Seeger, Ernst: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Seeger, Ernst; and Kahling, Joachim, 4,288,437, Cl. 424-246.000.

Segawa, Yoshihiro: *See*—
Yasuda, Eturo; Segawa, Yoshihiro; and Ohta, Minoru, 4,287,751, Cl. 73-23.000.

Seguin, Herb J. J.; Tulip, John; and Nam, Kyong H., to Canadian Patents & Dev. Limited. High power laser and cathode structure thereof. 4,288,758, Cl. 331-94.5PE.

Seiden, Frederick C.: *See*—
Meyers, George L.; Seiden, Frederick C.; and Waller, Lonnie J., 4,287,704, Cl. 53-564.000.

Seitz, Karl: *See*—
Wanner, Karl; Reibetanz, Wilbert; Dohse, Hans-Peter; Baumann, Otto; Spiwokz, Dietmar; Seitz, Karl; Angermair, Ernst; and Wiesner, Herbert, 4,288,187, Cl. 409-180.000.

Seitz, William R., to Bendix Corporation, The. Closed loop engine control system. 4,287,865, Cl. 123-489.000.

Sekiguchi, Hideki; Miyoshi, Michizo; and Yonemura, Katsutoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Direct contact condenser. 4,288,393, Cl. 261-108.000.

Sekiwa, Seiichiro; Kawate, Kenji; and Jinnouchi, Hidenobu, to Daidotokushuko. Method for cooling a metal strip during the process of heat treatment. 4,288,258, Cl. 148-13.000.

Sele, Alex: *See*—
Haas, Georges; Rossi, Alberto; Jaeggi, Knut A.; and Sele, Alex, 4,288,450, Cl. 424-283.000.

Selivanov, Anatoly G.; Yakovlev, Grigory P.; Khodyrev, Vladimir I.; and Zhivetin, Valery V. Drying installation. 4,287,674, Cl. 34-201.000.

Sellner, Harvey R.; and Wada, Robert T., to Perkin-Elmer Corporation, The. Currency discriminator. 4,288,781, Cl. 340-146.30Q.

Sendzimir, Tadeusz. Variable capacity strip accumulator rotatable on a horizontal axis. 4,288,042, Cl. 242-55.000.

Senin, Paolo: *See*—
Rovati, Luigi; Makovec, Francesco; and Senin, Paolo, 4,288,609, Cl. 560-117.000.

Senno, Harufumi; Sakakima, Hiroshi; Yanagiuchi, Yukihiro; Inoue, Tsuneo; Yamaguchi, Masatsugu; and Hirota, Eiichi, to Matsushita Electric Industrial Co. Ltd. Method of heat treatments of amorphous alloy ribbons. 4,288,260, Cl. 148-121.000.

Seoka, Yoshio; Aoki, Kozo; Yokota, Yukio; and Kubodera, Seiiti, to Fuji Photo Film Co., Ltd. Color photographic materials containing cyan color-forming couplers. 4,288,532, Cl. 430-385.000.

Seragnoli, Enzo, to G.D. Societa per Azioni. Device for feeding and adjusting a continuous web and for cutting it into portions. 4,287,797, Cl. 83-74.000.

Serras-Paulet, Edouard. Control keyboard with switches of mechanical constructions. 4,288,787, Cl. 340-365.00R.

Setterberg, John R., Jr., to Otis Engineering Corporation. Well sealing system. 4,288,082, Cl. 277-125.000.

Severin, Manfred; and Marsch, Hans-Dieter, to Uhde GmbH. Apparatus for lining the inner walls of industrial furnaces. 4,287,839, Cl. 110-331.000.

Shaffer, Robert C.: *See*—
Lewis, Kenneth W.; and Shaffer, Robert C., 4,288,568, Cl. 525-111.000.

Shalun, Grigory B.: *See*—
Surzhenko, Evgeny M.; Basilaev, Bronislav F.; Molotkov, Roman V.; Madorsky, Alexandr S.; Shalun, Grigory B.; Golynkina, Valentina B.; Ershova, Margarita A.; Eliseeva, Irina P.; Trukhtenkova, Nina E.; Gurylev, Sergei M.; Kopetskaya, Diana L.; Pechko, Evgeny Y.; Khlamenko, Albert S.; and Magnitsky, Viktor V., 4,288,491, Cl. 428-332.000.

Shann, Thomas P.: *See*—
Lieberman, Samuel, 4,288,325, Cl. 210-449.000.

Sharp Kabushiki Kaisha: *See*—
Aiba, Masahiko; and Umeda, Ikuo, 4,288,796, Cl. 346-75.000.
Ohkado, Michio, 4,288,118, Cl. 292-201.000.

Sharpoint, Inc.: *See*—
Hoffman, Luther A.; and Schmidt, Friedrich W., 4,287,987, Cl. 206-63.300.

Shaw, Stuart W., to International Nickel Company, Inc., The. Nickel-base superalloys. 4,288,247, Cl. 75-171.000.

Sheats, John E.: *See*—
Magers, Thomas A.; Sheats, John E.; and Tabb, David L., 4,288,541, Cl. 435-14.000.

Shefsiek, Paul K.: *See*—
Gupta, Bhupendra K.; Shefsiek, Paul K.; and Fraim, Freeman W., 4,288,062, Cl. 266-88.000.

Shelef, Gedaliahu. Method and apparatus for composting sludge. 4,288,241, Cl. 71-9.000.

Shell Oil Company: *See*—
Day, Janet A.; and Searle, Robert J. G., 4,288,367, Cl. 260-326.270.
Shepley, John D.; and Muijs, Herman M., 4,288,331, Cl. 252-8.900.
van Zon, Arie; de Jong, Feike; and Torny-Schutte, Gerridina J., 4,288,333, Cl. 252-8.55B.
Wagstaff, Nigel, 4,288,645, Cl. 585-415.000.

Shelton, J. Paul, to United States of America, Navy. Anastigmatic three-dimensional bootlace lens. 4,288,795, Cl. 343-754.000.

Shen, Chen S.: *See*—
Kresta, Jiri; and Shen, Chen S., 4,288,562, Cl. 521-121.000.

Shepherd, John V.; and Sutton, Eric M. Photosensitive materials. 4,288,525, Cl. 430-253.000.

Shepley, John D.; and Muijs, Herman M., to Shell Oil Company. Lubricating compositions for primary backing fabrics used in the manufacture of tufted textile articles. 4,288,331, Cl. 252-8.900.
Sherman, Charles J.: *See*—
Griffith, Gary L.; Johnsen, Richard G.; and Sherman, Charles J., 4,288,140, Cl. 339-74.00R.
Sherman, Eli H. Impulse generator for use with phosphor energizable lamps. 4,288,724, Cl. 315-219.000.
Shevchuk, Viktor I.: *See*—
Goncharov, Evgeny S.; Prilutsky, Anatoly N.; and Shevchuk, Viktor I., 4,287,779, Cl. 74-26.000.
Shields, Roger W.: *See*—
Molinick, George C.; and Shields, Roger W., 4,288,789, Cl. 340-524.000.
Shim, Kyung S., to Stauffer Chemical Company. Process for the production of mono-halothiophenols and thiophenols. 4,288,628, Cl. 568-65.000.
Shima, Yoshihiro: *See*—
Kashioka, Seiji; Shima, Yoshihiro; Miyatake, Takafumi; Ejiri, Masakazu; and Obata, Osamu, 4,288,816, Cl. 358-138.000.
Shimakawa, George: *See*—
Kobayashi, Masatoshi; Shimakawa, George; Hara, Yukio; and Fujii, Hiroyuki, 4,288,284, Cl. 156-651.000.
Shimano Industrial Company, Limited: *See*—
Hotta, Masashi, 4,287,943, Cl. 165-104.190.
Shimizu, Tasuku: *See*—
Sakata, Shinji; Yokota, Hirakazu; Shimizu, Tasuku; and Otawara, Yasuhiko, 4,288,677, Cl. 219-121.0ED.
Shimoda Kogyo, Ltd.: *See*—
Takemori, Kanji, 4,287,992, Cl. 211-49.00D.
Shimogawa, Toshiaki: *See*—
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; Shimogawa, Toshiaki; and Chiba, Seiichi, 4,288,098, Cl. 280-806.000.
Shimono, Muchiji, to Yoshida Kogyo K. K. Apparatus for manufacturing a slide fastener stringer having a woven coiled coupling element. 4,287,918, Cl. 139-35.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Arai, Masatoshi; and Futatsumori, Koji, 4,288,375, Cl. 260-348.410.
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Sado, Ryoichi, 4,288,081, Cl. 277-1.000.
Shin, Shouichi: *See*—
Manabe, Takao; Ebata, Hitoshi; and Shin, Shouichi, 4,288,851, Cl. 364-475.000.
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Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, 4,288,251, Cl. 501-105.000.
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Iizumi, Tomomitsu, 4,287,812, Cl. 91-420.000.
Sholette, William P.: *See*—
Joshi, Ashok V.; and Sholette, William P., 4,288,505, Cl. 429-191.000.
Shore, Daniel B.: *See*—
Chatterjea, Probir K.; and Shore, Daniel B., 4,287,813, Cl. 91-434.000.
Sieben, Joannus H. F. C., to U.S. Philips Corporation. Cassette. 4,288,048, Cl. 242-198.000.
Sieber, Konrad: *See*—
Klausbruckner, Gert; and Sieber, Konrad, 4,288,193, Cl. 414-342.000.
Siedenstrang, Roy W.; and Cornell, William H., to Phillips Petroleum Company. Process for low pressure molding thermoplastic elastomer compositions. 4,288,399, Cl. 264-25.000.
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Beyer, Franz; and Schucht, Peter, 4,288,760, Cl. 333-116.000.
Fahrenschon, Franz; Meier, Alfred; and Thinschmidt, Hans, 4,288,662, Cl. 179-3.000.
Leibenzeder, Siegfried; and Heindl, Christine, 4,287,848, Cl. 118-401.000.
Mayr, Ulrich; Horeth, Dietmar; and Kusmierz, Hans, 4,288,168, Cl. 400-322.000.
Utner, Ferdinand, 4,288,468, Cl. 427-45.100.
Weyns, Arthur, 4,287,770, Cl. 73-632.000.
Wiechert, Edelbert, 4,288,121, Cl. 293-4.000.
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Thoma, Hans, 4,287,810, Cl. 91-299.000.
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Kanda, Kaoru, 4,288,281, Cl. 156-540.000.
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Campbell, Charles D., 4,288,149, Cl. 351-170.000.
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Eckel, Wolf-Dietrich; and Schulz, Eckhard, 4,288,353, Cl. 260-28.00R.
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Sih, John C., to Upjohn Company, The. Esters of prostacyclin-type compounds. 4,288,606, Cl. 560-8.000.
Sih, John C., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-11-hydroxymethyl-19-oxo-PGF_2 compounds. 4,288,616, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Didehydro-19-oxo-PGF_1 compounds. 4,288,617, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 19-Oxo-PGF_2 analogs. 4,288,618, Cl. 562-503.000.
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Silver, Louis. Portable therapeutic sitz-bath, shower and bidet combination. 4,287,618, Cl. 4-443.000.
Silvey, E. Ray. Universal saw chain grinding machine. 4,287,793, Cl. 76-25.00A.
Sim, Terence; and Allen, Keith, to Vickers Limited. Underwater explosive welding. 4,288,022, Cl. 228-107.000.
Simmons, Graham M. A. Liquid measuring device. 4,288,009, Cl. 222-442.000.
Simmons, James R.: *See*—
Mossell, Alan T.; Simmons, James R.; and Middleton, Charles G., 4,288,270, Cl. 156-359.000.
Simon, Irwin B.: *See*—
Japikse, Cornelis H.; and Simon, Irwin B., 4,288,378, Cl. 260-409.000.
Sims, J. Robert, Jr., to Exxon Research & Engineering Co. Process energy recovery. 4,288,406, Cl. 422-131.000.
Singbartl, Gunther, to Wabco Westinghouse GmbH. Measuring sensor. 4,288,746, Cl. 324-174.000.
Singh, Prithipal; Khanna, Pyare L.; and Colvin, Floyd W., to Syva Company. Disopyramide compounds for conjugating proteins used in immunoassays for disopyramide. 4,288,553, Cl. 435-188.000.
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Foolen, Jan A., 4,288,106, Cl. 285-136.000.
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Singleton, Raymund: *See*—
Singleton, Albert; and Singleton, Raymund, 4,288,311, Cl. 204-279.000.
Slawyk, Wilhelm: *See*—
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Slovski, John: *See*—
Karnofsky, George B.; and Slovski, John, 4,288,297, Cl. 203-81.000.
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Miller, Lester I.; and Smearing, Thomas J., 4,288,351, Cl. 260-21.000.
Smirnov, Viktor A.: *See*—
Ljublinsky, Efim Y.; Smirnov, Viktor A.; and Kostylev, Anatoly A., 4,287,936, Cl. 164-329.000.
Smith, Alan: *See*—
McCrudden, Joseph E.; and Smith, Alan, 4,288,388, Cl. 260-502.00R.
Smith, Clifford E.: *See*—
Rolfe, Keith O.; and Smith, Clifford E., 4,287,997, Cl. 220-1.500.
Smith, Edward D.: *See*—
Oldfield, Thomas A.; Smith, Edward D.; and Furukawa, Hideo, 4,287,717, Cl. 60-606.000.
Smith, Edward R., to Patent Products, Inc. Tie down. 4,288,188, Cl. 410-97.000.
Smith, Frederick A., to Rotork Limited. Electric switch control unit, more particularly for electric motor driven actuators. 4,288,665, Cl. 200-18.000.
Smith, John R.: *See*—
Peters, Gordon L.; and Smith, John R., 4,287,741, Cl. 72-42.000.
Smith, Percy L.: *See*—
Comstock, Lowell R.; and Smith, Percy L., 4,288,571, Cl. 525-170.000.
Smith, Ulus R.: *See*—
Morrisey, John C., IV; and Smith, Ulus R., 4,288,315, Cl. 209-11.000.
Smith, Walton J. Flavor enhancer. 4,288,464, Cl. 426-548.000.
Smith, William S.: *See*—
Alexander, Clifton E.; Ford, Thomas R.; and Smith, William S., 4,287,692, Cl. 52-116.000.
Snamprogetti, S.p.A.: *See*—
Re, Luciano; Brant, Alberto; and Bassignani, Luciano, 4,288,366, Cl. 260-245.20R.
Snowden, Paul; and Steel, Margaret L., to Imperial Chemical Industries Limited. Spinning process and apparatus. 4,288,397, Cl. 264-8.000.
Societa Italiana Serie Acetica Sintetica S.p.A.: *See*—
Codignola, Franco; Vergini, Giorgio; Gronchi, Paolo; and Centola, Paolo, 4,288,641, Cl. 568-855.000.
S.A. Emile Chauvat et Sofranq Reunis: *See*—
Chauvat, Dominique; and Charpentier, Michel, 4,288,783, Cl. 340-149.00A.
Societe Miniere et Metallurgique de Penarroya: *See*—
DeMarthe, Jean-Michel; Gandon, Louis; and Georgeaux, Andre, 4,288,304, Cl. 204-111.000.
Societe Nationale des Poudres et Explosifs: *See*—
Pascal, Helene M.; and Emeury, Jean-Marie L., 4,288,638, Cl. 568-584.000.

Sofranko, Andrew J.: *See*—
Fuhrmann, Wilhelm; and Sofranko, Andrew J., 4,287,745, Cl. 72-248.000.

Sohnle, Rudiger: *See*—
Hagenlocher, Walter; Hesse, Heinz; Kleebaur, Karl; Kugel, Christoph; Kunz, Johann; Lemke, Werner; and Sohnle, Rudiger, 4,288,711, Cl. 310-68.00D.
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Garritsen, Petrus G. S.; MacVicar, Douglas J.; Young, Daniel P.; and Sojda, John G., 4,288,305, Cl. 204-112.000.

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Farmer, Robert F., III; and Sokol, Phillip E., deceased, 4,288,427, Cl. 424-70.000.

Sokol, Phillip E., deceased: *See*—
Farmer, Robert F., III; and Sokol, Phillip E., deceased, 4,288,427, Cl. 424-70.000.

Solarspan, Inc.: *See*—
Mattson, John P., 4,287,882, Cl. 126-445.000.

Solberg, Rino: *See*—
Jensen, Per, 4,287,688, Cl. 51-241.0VS.

Sollenberger, Edward, to Empire of Carolina, Inc. Timer. 4,287,964, Cl. 185-38.000.

Sombroek, Johannes; Becker, Karl-Heinz; Minck, Klaus O.; and Enenkel, Hans-Joachim, to Merck Patent Gesellschaft mit beschrankter Haftung. 1-Aryloxy-3-nitratoalkylamino-2-propanols and use as β-receptor blocker. 4,288,452, Cl. 424-304.000.

Somerville Belkin Industries Limited: *See*—
Zimmermann, John, 4,287,998, Cl. 229-16.00R.

Sommer, Werner: *See*—
Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius, 4,287,728, Cl. 66-125.00R.

Sony Corporation: *See*—
Hasuo, Masatoshi; and Tsuji, Jungo, 4,288,825, Cl. 360-88.000.
Okada, Takashi; and Kuniyoshi, Yasunobu, 4,288,754, Cl. 330-260.000.
Okita, Toshimichi, 4,288,766, Cl. 333-204.000.
Watanabe, Yoshimi, 4,288,824, Cl. 360-75.000.
Yabe, Toyoji, 4,288,809, Cl. 358-12.000.

Soo-Hoo, Edward, to Cartridge Actuated Devices, Inc. Pressurized gas bottle discharge device. 4,288,005, Cl. 222-5.000.

Soto Camara, Jose L.: *See*—
Brana, Miguel F.; Lopez Rodriguez, Maria L.; Castellano Berlanga, Jose M.; Soto Camara, Jose L.; and Martinez Roldan, Cristobal, 4,288,597, Cl. 546-265.000.

Soula, Gerard; and Linguenheld, Louis, to Rhone-Poulenc Industries. Ullmann reaction for the synthesis of diaryl ethers. 4,288,386, Cl. 260-465.00F.

Soundesign Corporation: *See*—
Yamamoto, Ryuji; Nakahara, Fukumori; and Kasai, Tadao, 4,288,823, Cl. 360-73.000.

South African Inventions Development Corp.: *See*—
Coetzer, Johan; and Thackeray, Michael M., 4,288,506, Cl. 429-199.000.

Southwire Company: *See*—
Lanier, Jerry W., 4,288,471, Cl. 427-120.000.
Ward, George C., 4,287,934, Cl. 164-482.000.

Southworth, Incorporated: *See*—
Brewer, John, 4,288,195, Cl. 414-608.000.

Souzu, Isao: *See*—
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,288,438, Cl. 424-251.000.

Spann, Robert. Antiskid device. 4,287,925, Cl. 152-221.000.

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Giuffre, Luigi; and Spaziante, Placido M., 4,288,382, Cl. 260-453.00A.

Spector, George: *See*—
Di Costanzo, Pasquale F.; and Spector, George, 4,287,645, Cl. 24-301.000.
Oyague, Ralph; and Spector, George, 4,288,076, Cl. 273-126.00R.

Speno International, S.A.: *See*—
Panetti, Romolo, 4,288,855, Cl. 364-561.000.

Sperry Corporation: *See*—
Hill, Roy K., 4,288,701, Cl. 250-569.000.
Lee, Patrick S., 4,288,731, Cl. 318-618.000.
Trost, John R., 4,288,860, Cl. 364-900.000.

Speth, Peter J. Windshield wiper blade assembly. 4,287,634, Cl. 15-250.420.

Spiess, Hans J.: *See*—
Kotthaus, Erich; and Spiess, Hans J., 4,287,686, Cl. 51-225.000.

Spivack, John D., to Ciba-Geigy Corporation. Alkylated 2,2'-biphenylene phosphites. 4,288,391, Cl. 260-927.00R.

Spiwokz, Dietmar: *See*—
Wanner, Karl; Reibetanz, Wilbert; Dohse, Hans-Peter; Baumann, Otto; Spiwokz, Dietmar; Seitz, Karl; Angermair, Ernst; and Wiesner, Herbert, 4,288,187, Cl. 409-180.000.

Sponer, Gisbert: *See*—
Friebe, Walter-Gunar; Michel, Helmut; Ross, Carl H.; Wiedemann, Fritz; Sponer, Gisbert; and Schaumann, Wolfgang, 4,288,442, Cl. 424-267.000.

Sprague Devices, Inc.: *See*—
Green, Charles J.; and Forsythe, Alan K., 4,287,906, Cl. 137-118.000.

Sprague Electric Company: *See*—
Schroeder, Walter W., 4,288,843, Cl. 361-433.000.

Spraker, Philip W., to Sybron Corporation. Microbiological process for removing oleaginous material from wastewater and microbiological combination capable of same. 4,288,545, Cl. 435-42.000.

Sprenkle, George J., to Burroughs Corporation. Side-loading wire wrapping assembly for semiautomatic wiring machines. 4,287,666, Cl. 29-753.000.

Springer, Helmut: *See*—
Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, 4,288,643, Cl. 585-324.000.

Springmann, Hermann, to Chemische Werke Huls AG. Process for separating sulfonic acids from the reaction products obtained when parafins are reacted with sulfur dioxide, oxygen and water in the presence of ultra-violet light. 4,288,389, Cl. 260-504.00S.

Sprintschnik, Gerhard; and Uhlig, Fritz, to Hoechst Aktiengesellschaft. Process of manufacturing light-sensitive copying material based on diazonium salt condensation products. 4,288,520, Cl. 430-169.000.

Square D Company: *See*—
Berry, Edgar L.; and Drilling, Joseph C., 4,288,138, Cl. 339-45.00R.
Lass, John L., 4,288,655, Cl. 174-65.00R.

Squire, Edward N., to Du Pont de Nemours, E. I., and Company. Synthesis of 3-buten-1-ol, 3,4-dichlorobutan-1-ol and 3-chlorotetrahydrofuran. 4,288,374, Cl. 260-347.910.

Staab, Joachim; Apel, Willy; and Wolf, Heinz, to Hartmann & Braun Aktiengesellschaft. Fluid analyzer construction and housing. 4,287,764, Cl. 73-431.000.

Stalteri, Franco. Process and apparatus for the production of synthetic chamois leather footwear. 4,287,629, Cl. 12-142.00R.

Standard Brands Incorporated: *See*—
Barrett, Steven P.; and Nelson, William J., 4,288,548, Cl. 435-94.000.

Standard Oil Company (Indiana): *See*—
Donohue, John A., 4,288,588, Cl. 528-348.000.
McCaulay, David A., 4,288,649, Cl. 585-533.000.
Rogan, John B.; and Buehler, Charles K., 4,288,580, Cl. 526-138.000.
Ury, George B., 4,287,752, Cl. 73-23.100.

Stangl, Rupert: *See*—
Brunken, Gerd; and Stangl, Rupert, 4,287,735, Cl. 70-395.000.

Stanton, Garth M., to Chevron Research Company. Process for preparing overbased alkaline earth metal sulfonates. 4,288,336, Cl. 252-33.000.

Stanton, Leo F., to Bush Universal, Inc. Apparatus for stiffening shoe insoles. 4,287,628, Cl. 12-40.500.

Stark, Charles J., Jr., to General Electric Company. Silylated catechol compositions. 4,288,603, Cl. 556-422.000.

Staub, Vincent M., Jr., to General Motors Corporation. Annular friction disc with radial grooving. 4,287,978, Cl. 192-113.00B.

Stauffer Chemical Company: *See*—
Baker, Don R.; and Teach, Eugene G., 4,288,605, Cl. 560-1.000.
Magee, Walter L.; and Telschow, Jeffrey E., 4,288,604, Cl. 556-470.000.
Rumanowski, Edmund J., 4,288,610, Cl. 560-124.000.
Shim, Kyung S., 4,288,628, Cl. 568-65.000.
Walker, Francis H., 4,288,373, Cl. 260-347.300.
Walker, Francis H., 4,288,384, Cl. 260-464.000.

Steck, Hans: *See*—
Konrad, Klaus-Dieter; Kellersohn, Rudolf; Steck, Hans; and Schaub, Josef, 4,288,266, Cl. 156-158.000.

Steel, Margaret L.: *See*—
Snowden, Paul; and Steel, Margaret L., 4,288,397, Cl. 264-8.000.

Steiger, Bruce W., to Hydra-Mac, Inc. Variable capacity radiator system for off-highway vehicles. 4,287,961, Cl. 180-68.00R.

Steigerwald, Robert L.: *See*—
Wilson, James W. A.; and Steigerwald, Robert L., 4,288,732, Cl. 318-723.000.

Steinbock GmbH: *See*—
Klausbruckner, Gert; and Sieber, Konrad, 4,288,193, Cl. 414-342.000.

Steinmann, Friedrich: *See*—
Kreissig, Ernst; and Steinmann, Friedrich, 4,287,832, Cl. 105-176.000.

Stell, Joseph E.: *See*—
Gudnason, Geir V.; and Stell, Joseph E., 4,288,551, Cl. 435-168.000.

Stemper, Harry: *See*—
Dudleston, Alan R.; and Stemper, Harry, 4,287,789, Cl. 74-516.000.

Stensson, Bo G.; Harstrom, Jan O.; and Csiba, Jan, to SAB Industri AB. Device at a brake actuator. 4,287,968, Cl. 188-74.000.

Sterling Drug, Inc.: *See*—
Ellis, Claude E., 4,288,109, Cl. 285-158.000.

Stevens, Roy W., to Research Corporation. Serological test for syphilis. 4,288,426, Cl. 424-1.000.

Stevenson, William G.: *See*—
Feeney, George W.; and Stevenson, William G., 4,288,567, Cl. 525-99.000.

Stewart Stamping Corp.: *See*—
Wolfthal, Maurice, 4,287,748, Cl. 72-405.000.

Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Lettner, Kurt; Egger, Eugen; and Unger, Rudolf, 4,287,861, Cl. 123-198.00E.

Stilwell, George R., Jr.: *See*—
Kolodzey, James S.; Noel, Francis E., Jr.; and Stilwell, George R., Jr., 4,288,869, Cl. 370-31.000.

Stoffel, Axel, to International Business Machines Corporation. Method for making an improved polysilicon conductor structure utilizing reactive-ion etching and thermal oxidation. 4,287,661, Cl. 29-571.000.

Stoffel, James C.: *See—*
Lavallee, Pierre A.; and Stoffel, James C., 4,288,821, Cl. 358-293.000.
Stoll, Kurt. Connecting piece for supply lines carrying gaseous or fluid media. 4,288,112, Cl. 285-238.000.
Stone & Webster Engineering Corporation: *See—*
Gartside, Robert J.; and Woebcke, Herman N., 4,288,235, Cl. 55-196.000.
Storcel, Joseph A.: *See—*
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Storey, Richard: *See—*
Drewery, John O.; and Storey, Richard, 4,288,810, Cl. 358-16.000.
Storgard, David N., to Dana Corporation. Fuel tank selector valve. 4,287,908, Cl. 137-255.000.
Stork Brabant B.V.: *See—*
Vertegaal, Jacobus G., 4,288,212, Cl. 432-8.000.
Stover, Harry L. Microwave transformer. 4,288,759, Cl. 333-24.00R.
Stratton, David W. Slipper tray and footrest. 4,287,835, Cl. 108-26.000.
Streit, Kenneth F., to Techplastics, Inc. Collar coupled plastic conduit. 4,288,108, Cl. 285-137.00R.
Strub, Fritz, to Filtrox Maschinenbau AG. Support with rotary symmetric openings for filter aid, method and apparatus. 4,288,330, Cl. 210-777.000.
Students, Peter A., to Chemetron Corporation. Carbon dioxide snow hood with J-horn. 4,287,719, Cl. 62-10.000.
Stupar, James A., to Baxter Travenol Laboratories, Inc. Suction catheter having a non-stressed vacuum regulator. 4,287,889, Cl. 128-276.000.
Stutz, Frank: *See—*
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Styles, Virgil L.: *See—*
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,288,365, Cl. 260-243.300.
Sugai, Takatoshi: *See—*
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Sugimura, Kazuo; and Sugimura, Nobuyuki. Semispherical shape valve device in bladder type accumulators. 4,287,916, Cl. 138-30.000.
Sugimura, Nobuyuki: *See—*
Sugimura, Kazuo; and Sugimura, Nobuyuki, 4,287,916, Cl. 138-30.000.
Sugo, Takanobu: *See—*
Machi, Sueo; Ishigaki, Isao; and Sugo, Takanobu, 4,288,467, Cl. 427-44.000.
Sullivan, Michael T. Duct jointing system. 4,288,115, Cl. 285-363.000.
Sulzer Brothers Limited: *See—*
Schneider, Hans, 4,287,932, Cl. 164-516.000.
Sulzer Morat GmbH: *See—*
Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius, 4,287,728, Cl. 66-125.00R.
Sumitomo Chemical Co. Ltd.: *See—*
Kanazawa, Hiroyuki; and Futagami, Mikio, 4,288,357, Cl. 260-31.20N.
Kirino, Osamu; Hashimoto, Shunichi; Matsumoto, Hiroshi; and Oshio, Hiromichi, 4,288,244, Cl. 71-118.000.
Saji, Ikutaro; Aono, Shunji; Okuda, Takao; and Agui, Hideo, 4,288,448, Cl. 424-273.00R.
Sano, Takezo; Inoue, Haruo; and Furuta, Akihiro, 4,288,529, Cl. 430-308.000.
Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See—*
Sakamoto, Yoshiyasu; Tamura, Yoichi; Kawaguchi, Kiyohiko; and Inada, Kiyotaka, 4,288,162, Cl. 356-335.000.
Sunbeam Corporation: *See—*
Wolter, Gilbert R., 4,287,673, Cl. 34-97.000.
Sunbeam Plastics Corporation: *See—*
Luker, Charles E.; and Gach, Peter P., 4,288,000, Cl. 220-281.000.
Sundeen, Joseph E.; Dejneka, Tamara; and Hauck, Frederic P., to E. R. Squibb & Sons, Inc. Compositions containing 1-aryl-5-(2-propenylamino)-1-penten-3-ones and method for treating inflammatory conditions. 4,288,456, Cl. 424-330.000.
Suntech, Inc.: *See—*
Janoski, Edward J.; Schneider, Abraham; and Ware, Richard E., 4,288,644, Cl. 585-360.000.
Suntory Limited: *See—*
Kusumi, Takenori; and Nakanishi, Koji, 4,288,445, Cl. 424-272.000.
Suominen, Heikki S. Tubular insulating curtain and method of manufacture. 4,288,485, Cl. 428-116.000.
Surgical Appliance Industries, Inc.: *See—*
Applegate, Leslie T., 4,287,884, Cl. 128-80.00C.
Applegate, Leslie T., 4,287,885, Cl. 128-80.00C.
Surzhenko, Evgeny M.; Basilaev, Bronislav F.; Molotkov, Roman V.; Madorsky, Alexandr S.; Shalun, Grigory B.; Golynkina, Valentina B.; Ershova, Margarita A.; Eliseeva, Irina P.; Trukhtenkova, Nina E.; Gurylev, Sergei M.; Kopetskaya, Diana L.; Pechko, Evgeny Y.; Khlamenko, Albert S.; and Magnitsky, Viktor V. Laminated plastic material. 4,288,491, Cl. 428-332.000.
Suss, Hans G.: *See—*
Zeindler, Stephan; and Suss, Hans G., 4,288,859, Cl. 364-900.000.
Sutton, Eric M.: *See—*
Shepherd, John V.; and Sutton, Eric M., 4,288,525, Cl. 430-253.000.
Sutton, James O., II. Computer controlled backhoe. 4,288,196, Cl. 414-699.000.
Sutton, Richard C.: *See—*
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Suzuki, Hajime: *See—*
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Suzuki, Hideo: *See—*
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Suzuki, Kinzaburo: *See—*
Yoshikumi, Chikao; Wada, Toshihiko; Makita, Himromitsu; and Suzuki, Kinzaburo, 4,288,555, Cl. 435-254.000.
Suzuki, Shuichi; and Karube, Isao, to Kyowa Hakko Kogyo Co., Ltd. Method and apparatus for measuring microorganism activity. 4,288,544, Cl. 435-39.000.
Svoboda, Josef, to TMC Corporation. Safety ski binding. 4,288,094, Cl. 280-623.000.
Svoboda, Josef: *See—*
Krob, Erwin; and Svoboda, Josef, 4,288,093, Cl. 280-605.000.
Swainson, Wyn K.; and Kramer, Stephen D., to Formigraphic Engine Corporation. Three-dimensional systems. 4,288,861, Cl. 365-127.000.
Swanson, Arthur F., to International Telephone and Telegraph Corporation. Free-spring wire connector. 4,288,657, Cl. 174-87.000.
Swearingen, Judson S., to Rotoflow Corporation, Inc. Shaft mounting device and method. 4,287,758, Cl. 73-862.490.
Swiss Aluminium Ltd.: *See—*
Eckel, Wolf-Dietrich; and Schulz, Eckhard, 4,288,353, Cl. 260-28.00R.
Zehnder, Jurg; and Neumeier, Erich, 4,287,834, Cl. 105-420.000.
Sybron Corporation: *See—*
Spraker, Philip W., 4,288,545, Cl. 435-42.000.
Sydansk, R. D.; and Gucwa, P. R., to Marathon Oil Company. Process for improving conformance and flow profiles in a subterranean sandstone formation. 4,287,951, Cl. 166-281.000.
Syracuse Tank & Manufacturing: *See—*
Campbell, George L., 4,287,739, Cl. 72-34.000.
Syva Company: *See—*
Singh, Prithipal; Khanna, Pyare L.; and Colvin, Floyd W., 4,288,553, Cl. 435-188.000.
Szekely, Jozsef: *See—*
Bajusz, Sandor; Ronay, Andras; and Szekely, Jozsef, 4,288,432, Cl. 424-177.000.
Tabb, David L.: *See—*
Magers, Thomas A.; Sheats, John E.; and Tabb, David L., 4,288,541, Cl. 435-14.000.
Tachibana, Shinichi: *See—*
Kiyama, Yosito; Tachibana, Shinichi; Yamashita, Riichiro; and Horino, Takeshi, 4,288,688, Cl. 235-384.000.
Tack, Hans: *See—*
Kruger, Heinrich; and Tack, Hans, 4,288,179, Cl. 407-114.000.
Taisho Pharmaceutical Co., Ltd.: *See—*
Kameyama, Tsutomu, 4,288,596, Cl. 546-198.000.
Tajima, Yoshio: *See—*
Miyoshi, Mitsuji; Tajima, Yoshio; Matsuura, Kazuo; Kuroda, Nobuyuki; and Matsuno, Mitsuo, 4,288,579, Cl. 526-124.000.
Takada, Shigetaka; and Naruse, Kazumichi, to Aisan Industry Co., Ltd. Air-fuel mixture ratio control device. 4,287,864, Cl. 123-440.000.
Takada, Toshiyuki: *See—*
Fujikawa, Tetsuzo; Takada, Toshiyuki; and Misawa, Kichiji, 4,287,860, Cl. 123-73.0PP.
Takai, Isao, to Oda Gosen Kogyo Kabushiki Kaisha. False-twisting system. 4,287,714, Cl. 57-336.000.
Takami, Akio; Matsuura, Toshitaka; and Saito, Tsutomu, to NGK Spark Plug Co., Ltd. Gas detector. 4,288,774, Cl. 338-34.000.
Takano, Suwaji: *See—*
Enokimoto, Akito; Tsuchiya, Toshio; Masuda, Tatsuo; and Takano, Suwaji, 4,288,096, Cl. 280-694.000.
Takaoka, Haruyoshi: *See—*
Kikuchi, Hideo; Takaoka, Haruyoshi; and Baba, Shigenori, 4,288,804, Cl. 357-42.000.
Takarabe, Takeki: *See—*
Ota, Hiroshi; Sakuma, Noboru; Takarabe, Takeki; and Takiguchi, Isao, 4,288,337, Cl. 252-512.000.
Takasago Perfumery Co., Ltd.: *See—*
Yamanaka, Tohr; and Imai, Takashi, 4,288,642, Cl. 568-903.000.
Takaya, Takao; and Murata, Masayoshi, to Fujisawa Pharmaceutical Co., Ltd. 3,7-Disubstituted-3-cephem-4-carboxylic acid compounds. 4,288,436, Cl. 424-246.000.
Takei, Toshihiro: *See—*
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; Shimogawa, Toshiaki; and Chiba, Seiichi, 4,288,098, Cl. 280-806.000.
Takemori, Kanji, to Shimoda Kogyo, Ltd. Rack structure. 4,287,992, Cl. 211-49.00D.
Takenouchi, Mutsuo: *See—*
Ozawa, Takashi; and Takenouchi, Mutsuo, 4,288,702, Cl. 250-578.000.
Takeuchi, Hidehiro: *See—*
Umeda, Haruhiko; Takeuchi, Hidehiro; Uenoyama, Masaru; Ishizuki, Kotoshige; Ando, Hiroyuki; and Hara, Hideo, 4,288,091. l. 280-415.00A.
Takeuchi, Tadashi; and Yamabe, Taiji, to Daicel Ltd. Fiber for optical communications. 4,288,145, Cl. 350-96.340.
Takiguchi, Isao: *See—*
Ota, Hiroshi; Sakuma, Noboru; Takarabe, Takeki; and Takiguchi, Isao, 4,288,337, Cl. 252-512.000.
Talley, Bruce J.; and Tolbert, Barry G., to Talley & Sons, Inc. Closed circuit video guidance system for farming vehicles and method. 4,288,814, Cl. 358-93.000.
Talley & Sons, Inc.: *See—*
Talley, Bruce J.; and Tolbert, Barry G., 4,288,814, Cl. 358-93.000.

Tamburelli, Giovanni, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Equalizer for the correction of digital signals. 4,288,872, Cl. 375-14.000.
Tamura, Tstsuji: *See*—
Fujiwara, Minoru; Yamada, Tominori; and Tamura, Tstsuji, 4,287,790, Cl. 74-665.0GB.
Tamura, Yoichi: *See*—
Sakamoto, Yoshiyasu; Tamura, Yoichi; Kawaguchi, Kiyohiko; and Inada, Kiyotaka, 4,288,162, Cl. 356-335.000.
Tanaka, Kunihiko: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,288,435, Cl. 424-246.000.
Tanaka, Minoru. Method of making and ornamenting shirts and shorts. 4,287,612, Cl. 2-243.00R.
Tanaka, Mutsuhiro; and Kashiwagi, Masatoshi, to Mitsui Petrochemical Industries Ltd. Silicone-coated article and process for production thereof. 4,288,497, Cl. 428-447.000.
Tanaka, Seiichi: *See*—
Matsunaga, Fujihisa; Shinohara, Yoshiyuki; Okubo, Isamu; Nakamura, Takayuki; and Tanaka, Seiichi, 4,288,637, Cl. 568-575.000.
Tanaka, Takeshi: *See*—
Kojima, Hiroshi; Ito, Kunio; Akiyama, Masami; and Tanaka, Takeshi, 4,288,521, Cl. 430-169.000.
Tanaka, Taro: *See*—
Noguchi, Masaaki; Tanaka, Taro; and Kato, Yoji, 4,287,862, Cl. 123-310.000.
Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,287,859, Cl. 123-51.0BA.
Tango, Hiroyuki, to Agency of Industrial Science and Technology. Protective circuit on insulating substrate for protecting MOS integrated circuit. 4,288,829, Cl. 361-56.000.
Taniguchi, Fumio. Fastening device for papers. 4,288,018, Cl. 227-76.000.
Tanji, Hiroaki; Saito, Mitsuaki; and Ishii, Masaji, to Denki Kagaku Kogyo Kabushiki Kaisha. Thermionic cathode apparatus. 4,288,717, Cl. 313-336.000.
Tarradellas, Norbert R.: *See*—
Cox, Robert P.; and Tarradellas, Norbert R., 4,288,234, Cl. 55-48.000.
Tarran, Phil K. Emergency rescue axe device. 4,287,623, Cl. 7-158.000.
Tate, Ralph: *See*—
Buchser, William J.; Tate, Ralph; and Haag, Charles W., 4,288,135, Cl. 312-296.000.
Tatrai, Lajos: *See*—
Bucsky, Gyorgy; Kiss, Zoltan; and Tatrai, Lajos, 4,287,757, Cl. 73-61.400.
Tatsumi Seiki Co., Ltd.: *See*—
Otoshi, Kazuo, 4,287,727, Cl. 66-75.200.
Taylor, Attalee S.: *See*—
Cobaugh, Robert F.; Lynch, James E.; and Taylor, Attalee S., 4,288,139, Cl. 339-74.00R.
Taylor, David W., to Microfuels, Inc. Coal treatment process. 4,288,231, Cl. 44-1.0SR.
Taylor, John A.: *See*—
Porter, Christopher H.; and Taylor, John A., 4,288,494, Cl. 428-398.000.
Taylor, Lloyd D., to Polaroid Corporation. Diffusion control layers in diffusion transfer photographic products. 4,288,523, Cl. 430-215.000.
Teach, Eugene G.: *See*—
Baker, Don R.; and Teach, Eugene G., 4,288,605, Cl. 560-1.000.
Technicare Corporation: *See*—
Walters, Ronald G.; and Carlson, Roland W., 4,288,695, Cl. 250-445.00T.
Technicon Instruments Corporation: *See*—
Lee, Martin J.; and Ornstein, Leonard, 4,288,425, Cl. 424-1.000.
Oberhardt, Bruce J., 4,288,228, Cl. 23-230.00R.
Techplastics, Inc.: *See*—
Streit, Kenneth F., 4,288,108, Cl. 285-137.00R.
Teichmann, Michael: *See*—
Lautenschlager, Peter; and Teichmann, Michael, 4,287,894, Cl. 128-687.000.
Teijin Limited: *See*—
Norota, Susumu; Kiriyama, Tsutomu; and Imoto, Tadasi, 4,288,484, Cl. 428-113.000.
Tektronix, Inc.: *See*—
Holmes, Robert E., 4,288,776, Cl. 338-308.000.
Rogers, Jerrold J.; and Durecka, John, 4,288,738, Cl. 323-271.000.
Telschow, Jeffrey E.: *See*—
Magee, Walter L.; and Telschow, Jeffrey E., 4,288,604, Cl. 556-470.000.
Tennemann, Volkmar: *See*—
Ebeling, Wilfried; and Tennemann, Volkmar, 4,288,230, Cl. 23-230.00A.
Teraji, Tsutomu: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,288,435, Cl. 424-246.000.
Ter Heide, Roelof: *See*—
Boelens, Harmannus; and Ter Heide, Roelof, 4,288,349, Cl. 252-522.00R.
Terner, Leslie L.; Van Alsten, Roy L.; and Moskowitz, David, to Ford Motor Company. Article coated with beta silicon carbide and silicon. 4,288,495, Cl. 428-446.000.
Texaco Development Corporation: *See*—
McCoy, David R.; and Naylor, Carter G., 4,288,334, Cl. 252-8.55D.
Texas Instruments Incorporated: *See*—
Bate, Robert T.; and Morris, Henry B., 4,288,470, Cl. 427-88.000.
Puccini, Richard E., 4,288,672, Cl. 200-314.000.
Reese, Edmund A.; White, Lionel S., Jr.; and McAlexander, Joseph C., III, 4,288,706, Cl. 307-577.000.
Textron, Inc.: *See*—
Baker, Larry R., 4,287,670, Cl. 30-276.000.
Osborne, Gregory W.; Ripley, William C.; and Wilson, Robert E., 4,288,794, Cl. 343-708.000.
Thackeray, Michael M.: *See*—
Coetzer, Johan; and Thackeray, Michael M., 4,288,506, Cl. 429-199.000.
Thayer, Paul M.: *See*—
Ewing, Lloyd; Redmon, David T.; Thayer, Paul M.; Schmit, Frank L.; and Roche, William H., 4,288,394, Cl. 261-122.000.
Theodoru, Alexander S.; and Theodoru, Stefan G. Pattern recognition system. 4,288,780, Cl. 340-146.30Z.
Theodoru, Stefan G.: *See*—
Theodoru, Alexander S.; and Theodoru, Stefan G., 4,288,780, Cl. 340-146.30Z.
Thermatool Corp.: *See*—
Oppenheimer, Edgar D.; Udall, Humfrey N.; and Rudd, Wallace C., 4,287,947, Cl. 165-183.000.
Thiessen, Henry F. Attachment apparatus for side-by-side bicycles. 4,288,089, Cl. 280-209.000.
Thinschmidt, Hans: *See*—
Fahrenschon, Franz; Meier, Alfred; and Thinschmidt, Hans, 4,288,662, Cl. 179-3.000.
Thoma, Hans, to SIG - Schweizerische Industrie-Gesellschaft. Drive for a pneumatic hammer. 4,287,810, Cl. 91-299.000.
Thomas, John D.: *See*—
Wallace, Harry L.; and Thomas, John D., 4,288,069, Cl. 271-245.000.
Thompson, Harris A. Remote pressure sensor tube for the alarm system of a respirator. 4,287,886, Cl. 128-202.220.
Thompson, Leonard R., to Dow Chemical Company, The. Decomposition inhibitors for high temperature storage and distillation of chlorinated phenols. 4,288,296, Cl. 203-6.000.
Thompson, Paige W., to General Electric Company. Device for closing a metallic tube. 4,287,746, Cl. 72-338.000.
Thompson, Wallace M., to American Hoist & Derrick Company. Slush pulp baler. 4,287,823, Cl. 100-129.000.
Thomson-Brandt: *See*—
Tinet, Claude; and Lemonon, Claire, 4,288,510, Cl. 430-11.000.
Thomson-CSF: *See*—
Depey, Maurice, 4,288,805, Cl. 357-44.000.
Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, 4,288,822, Cl. 358-296.000.
Papuchon, Michel; Puech, Claude; and Anne, Jean C., 4,288,785, Cl. 340-347.0DA.
Picquendar, Jean E.; Marchal, Michel; Dubois, Jean C.; and Duda, Eugene, 4,288,528, Cl. 430-297.000.
Thornburg, David D.; and Rosen, Brian, to Xerox Corporation. Capacitance controlled keyswitch. 4,288,836, Cl. 361-288.000.
Thornton, Richard D.: *See*—
Matthias, Dan W.; and Thornton, Richard D., 4,288,709, Cl. 310-49.00R.
Thorpe, David, to Imperial Chemical Industries Limited. Process for the manufacture of a glass fibre-reinforced plastics article and a glass fibre paste or slurry for use in the process. 4,288,563, Cl. 521-122.000.
Tidland GmbH: *See*—
Romhild, Werner, 4,288,045, Cl. 242-75.530.
Tigwell, David C.; and Schaeffer, David J. Automatic multiple water sampler. 4,288,206, Cl. 417-517.000.
Tilley, Jefferson W.: *See*—
Kramer, Michael J.; and Tilley, Jefferson W., 4,288,454, Cl. 424-321.000.
Timex Corporation: *See*—
Koch, Gene C., 4,288,147, Cl. 350-349.000.
Tinet, Claude; and Lemonon, Claire, to Thomson-Brandt. Process of making an optically recordable and readable information carrier and the carrier obtained by this process. 4,288,510, Cl. 430-11.000.
Ting, Gann: *See*—
Chang, Sir-Sea; Chern, Sheng-Laang; Ting, Gann; and Kuo, Tsai-Shu, 4,288,412, Cl. 423-10.000.
Tishura, Vladimir I.: *See*—
Kuchuk-Yatsenko, Sergei I.; Chernenko, Ivan A.; Bogorsky, Mikhail V.; Kulesh, Alexandr I.; Cherednichok, Vitaly T.; and Tishura, Vladimir I., 4,288,676, Cl. 219-100.000.
TMC Corporation: *See*—
Krob, Erwin; and Svoboda, Josef, 4,288,093, Cl. 280-605.000.
Svoboda, Josef, 4,288,094, Cl. 280-623.000.
Wittmann, Heinz; and Himmetsberger, Alois, 4,288,095, Cl. 280-625.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Sakakibara, Tadamori; Matsushima, Yoshihisa; Nagashima, Yukio; Okamoto, Nobukazu; Kaneko, Katsumi; Ishii, Yohio; and Wada, Shozo, 4,288,634, Cl. 568-454.000.
Tobin, Leo W., Jr. Gang mower assembly. 4,287,706, Cl. 56-7.000.
Tohda, Takao: *See*—
Wasa, Kiyotaka; Tohda, Takao; Yokoyama, Kazuo; Hirota, Eiichi; and Hayakawa, Shigeru, 4,288,307, Cl. 204-192.00D.
Tohzuka, Takashi: *See*—
Ohsaka, Yohnosuke; and Tohzuka, Takashi, 4,288,376, Cl. 260-348.230.

Tokyo Keiki Company Limited: *See*—
Ota, Hiroshi; Sakuma, Noboru; Takarabe, Takeki; and Takiguchi, Isao, 4,288,337, Cl. 252-512.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Katakura, Masayuki, 4,288,707, Cl. 307-264.000.
Saima, Tooru; Ohya, Isao; Imada, Takahiko; Sato, Hideo; and Katsuma, Shinichi, 4,288,290, Cl. 176-19.00R.
Sekiguchi, Hideki; Miyoshi, Michizo; and Yonemura, Katsutoshi, 4,288,393, Cl. 261-108.000.
Uesugi, Michika, 4,288,853, Cl. 364-557.000.

Tolbert, Barry G.: *See*—
Talley, Bruce J.; and Tolbert, Barry G., 4,288,814, Cl. 358-93.000.

Tommaso, Helio, to Produtos Eletricos Corona Ltda. Flow-activated resistance heater for water. 4,288,685, Cl. 219-309.000.

Tompkins, Russell E.: *See*—
Alley, Robert P.; and Tompkins, Russell E., 4,288,773, Cl. 336-160.000.

Tompson, Clement R.; and Gruner, Garrett. Valve for developing variable output pressure. 4,287,909, Cl. 137-312.000.

Tomura, Yasutomo: *See*—
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Hatano, Masashi; Hagiwara, Tatsuo; Mikamo, Masaaki; Ebihara, Yoshimasa; Tomura, Yasutomo; and Imai, Keiji, 4,288,166, Cl. 366-149.000.

Torii, Koshi: *See*—
Niimi, Masayoshi; Torii, Koshi; and Kato, Hidetoshi, 4,288,728, Cl. 318-139.000.

Torlay, Dwight L.: *See*—
Gana, John; and Torlay, Dwight L., 4,288,219, Cl. 432-234.000.

Tornier, Alain, to Etablissements Tornier. Femoral pin for hip prosthesis. 4,287,617, Cl. 3-1.913.

Torny-Schutte, Gerridina J.: *See*—
van Zon, Arie; de Jong, Feike; and Torny-Schutte, Gerridina J., 4,288,333, Cl. 252-8.55B.

Toshiba Kikai Kabushiki Kaisha: *See*—
Manabe, Takao; Ebata, Hitoshi; and Shin, Shouichi, 4,288,851, Cl. 364-475.000.
Yoshida, Tetsu; and Higashikawa, Katsunori, 4,288,849, Cl. 364-102.000.

Toth, James M., to Republic Steel Corporation. Method and apparatus for viewing glowing objects. 4,288,164, Cl. 356-445.000.

Toth, Tibor E., to Union Carbide Corporation. Welding system with reversible drive motor control. 4,288,682, Cl. 219-137.710.

Touch Activated Switch Arrays, Inc.: *See*—
Ledniczki, Ferenc; and Patak, Richard J., 4,288,786, Cl. 340-365.00S.

Towmotor Corporation: *See*—
Kulh ek, James A., 4,287,787, Cl. 74-493.000.

Toyo Jozo Kabushiki Kaisha: *See*—
Fujii, Tadashiro; Yaginuma, Satoshi; Muto, Naoki; and Hayashi, Mitsuo, 4,288,429, Cl. 424-117.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Ishibashi, Kazuhisa, 4,288,673, Cl. 219-10.690.
Ohmi, Hidehiko, 4,287,847, Cl. 118-215.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Haga, Shozi; and Ootani, Hisao, 4,287,977, Cl. 192-91.00A.
Ida, Shiuichiro; Ohshima, Shoichi; Hirashima, Syunichi; and Harada Yukihiro, 4,287,783, Cl. 74-467.000.
Ikuta, Yasuhiro; and Matsuo, Masashi, 4,287,866, Cl. 123-568.000.
Katagiri, Masayoshi; and Ogura, Osamu, 4,287,811, Cl. 91-369.00A.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,287,859, Cl. 123-51.0BA.
Numazawa, Akio; and Arai, Hajime, 4,287,791, Cl. 74-701.000.
Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; Shimogawa, Toshiaki; and Chiba, Seiichi, 4,288,098, Cl. 280-806.000.

Traber, Rene P.; Hofmann, Hans; Harri, Eugen; and Max, Kuhn, to Sandoz Ltd. Cyclosporin derivatives, their production and pharmaceutical compositions containing them. 4,288,431, Cl. 424-177.000.

Tracor Northern, Inc.: *See*—
Schamber, Frederick H.; and McCarthy, Jon J., 4,288,692, Cl. 250-310.000.

Treace, Harry T., to Richards Manufacturing Company, Inc. Container for medical device. 4,288,066, Cl. 269-270.000.

Trevarrow, David. Apparatus for truing bolting surfaces of wheels and the like. 4,288,180, Cl. 408-2.000.

Tri-L Manufacturing, Inc.: *See*—
Lynch, Bobby R., 4,288,191, Cl. 414-24.500.

Trio Kabushiki Kaisha: *See*—
Ogawa, Atsushi, 4,288,752, Cl. 329-50.000.
Sakai, Kazumasa, 4,288,755, Cl. 330-298.000.

Trost, John R., to Sperry Corporation. Dynamic storage synchronizer using variable oscillator and FIFO buffer. 4,288,860, Cl. 364-900.000.

Trotter, Jimmy R.; McConnell, Richard L.; and Joyner, Frederick B., to Eastman Kodak Company. Blends of propylene/1-butene or 1-pentene/higher α-olefin copolymers, compatible tackifying resins and plasticizing oils useful as hot-melt, pressure-sensitive adhesives. 4,288,358, Cl. 260-31.80M.

Trukhtenkova, Nina E.: *See*—
Surzhenko, Evgeny M.; Basilaev, Bronislav F.; Molotkov, Roman V.; Madorsky, Alexandr S.; Shalun, Grigory B.; Golynkina, Valentina B.; Ershova, Margarita A.; Eliseeva, Irina P.; Trukhtenkova, Nina E.; Gurylev, Sergei M.; Kopetskaya, Diana L.; Pechko, Evgeny Y.; Khlamenko, Albert S.; and Magnitsky, Viktor V., 4,288,491, Cl. 428-332.000.

Truly Magic Products, Inc.: *See*—
Kohler, Henry A., 4,287,649, Cl. 29-130.000.

Trummlitz, Gunter: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Seeger, Ernst; and Kahling, Joachim, 4,288,437, Cl. 424-246.000.

Truswal Systems Corporation: *See*—
Bowser, Donald M., 4,287,822, Cl. 100-35.000.

Trutzschler GmbH & Co.: *See*—
Leifeld, Ferdinand, 4,287,643, Cl. 19-114.000.

TRW, Inc.: *See*—
McDonald, John C.; Baichtal, James R.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig P., 4,288,870, Cl. 370-56.000.

Tseng, Shin-Shyong: *See*—
Rauhut, Michael M.; and Tseng, Shin-Shyong, 4,288,592, Cl. 544-159.000.

Tsuchiya, Toshio: *See*—
Enokimoto, Akito; Tsuchiya, Toshio; Masuda, Tatsuo; and Takano, Suwaji, 4,288,096, Cl. 280-694.000.

Tsuge, Noboru; Kuwakado, Satosi; Takei, Toshihiro; Shimogawa, Toshiaki; and Chiba, Seiichi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Piston return stop device for tensioning device of seat belt. 4,288,098, Cl. 280-806.000.

Tsuji, Jungo: *See*—
Hasuo, Masatoshi; and Tsuji, Jungo, 4,288,825, Cl. 360-88.000.

Tsujii, Yasuhiro: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, 4,288,599, Cl. 546-345.000.

Tsumita, Norikazu: *See*—
Umezaki, Hiroshi; Nishida, Hideki; Tsumita, Norikazu; Yamada, Hirozi; Kaneko, Katsuhiro; and Koiso, Nagatugu, 4,288,283, Cl. 156-643.000.

Tucker, Thomas: *See*—
Kaye, Robert M.; Eiloo, Gary A.; and Tucker, Thomas, 4,288,748, Cl. 324-326.000.

Tulip, John: *See*—
Seguin, Herb J. J.; Tulip, John; and Nam, Kyong H., 4,288,758, Cl. 331-94.5PE.

Turcotte, Hector. Reagent for the early detection of cancer. 4,288,540, Cl. 435-7.000.

Turk, Stanley D.: *See*—
Drake, Charles A.; and Turk, Stanley D., 4,288,625, Cl. 564-372.000.

Turley, Richard J.; and MacFarland, David R., to Olin Corporation. Preparation of noncellular polyurethane compositions. 4,288,587, Cl. 528-57.000.

Turner, Edwin C.: *See*—
Krause, William F.; and Turner, Edwin C., 4,287,954, Cl. 166-322.000.

Tuzson, John J., to Borg-Warner Corporation. Clutch with fusible material as protective element. 4,287,975, Cl. 192-82.00T.

Tyler, Derek E.: *See*—
Pryor, Michael J.; and Tyler, Derek E., 4,287,937, Cl. 164-418.000.

Ube Industries, Ltd.: *See*—
Ueno, Toyoaki; and Uchida, Masashi, 4,287,935, Cl. 164-314.000.

Uchida, Masashi: *See*—
Ueno, Toyoaki; and Uchida, Masashi, 4,287,935, Cl. 164-314.000.

Udall, Humfrey N.: *See*—
Oppenheimer, Edgar D.; Udall, Humfrey N.; and Rudd, Wallace C., 4,287,947, Cl. 165-183.000.

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Uhde GmbH: *See*—
Severin, Manfred; and Marsch, Hans-Dieter, 4,287,839, Cl. 110-331.000.

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Sprintschnik, Gerhard; and Uhlig, Fritz, 4,288,520, Cl. 430-169.000.

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Barthel, Alfred, 4,287,720, Cl. 62-45.000.
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Kaye, Alan S., 4,288,756, Cl. 331-94.50G.
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Ong, Lip H., 4,288,764, Cl. 333-165.000.
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Air Force: *See*—
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Newton, Cleland O.; and Paige, Edward G. S., 4,288,750, Cl. 328-158.000.
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Sackman, George L., 4,288,866, Cl. 367-11.000.
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Wilson, Gregory S., 4,288,201, Cl. 415-115.000.
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Basu, Samarnath; and Worrell, Wayne L., 4,288,508, Cl. 429-218.000.
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Johnson, Garland A.; and Peuler, Jacob D., 4,288,542, Cl. 435-15.000.
Sih, John C., 4,288,371, Cl. 260-346.220.
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Vandenkieboom, John; and Myers, Douglas, to LaSalle Machine Tool, Inc. Machining apparatus tool feed and retract system. 4,288,182, Cl. 408-129.000.
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Brazier, Alan J., 4,287,636, Cl. 15-321.000.
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Ruschek, Gerhard, 4,287,782, Cl. 74-405.000.
Veigel, Helmut, to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH. Boring tool. 4,288,184, Cl. 408-185.000.
Velling, Gunter. Method for the cooling of solid residues of gasification. 4,288,294, Cl. 201-39.000.
Venable, Joseph M., to Pamrod, Incorporated. Water insensitive bonded perlite structural materials. 4,288,253, Cl. 106-84.000.
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Schroder, Gerhard; and Feucht, Fritz, 4,288,054, Cl. 248-225.100.
Vergini, Giorgio: *See*—
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Leonard, Murray; and Jugl, Herbert F., 4,288,210, Cl. 431-263.000.
Vertac, Inc.: *See*—
Giuffre, Luigi; and Spaziante, Placido M., 4,288,382, Cl. 260-453.00A.
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Vickers Limited: *See*—
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Victor United, Inc.: *See*—
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Viertler, Albin, to Klein, Schanzlin & Becker AG. Support for multistage compressors. 4,288,204, Cl. 417-243.000.
Vigano', Vittorio. Machine for folding sheets. 4,288,067, Cl. 493-420.000.
Vinal, Albert W., to International Business Machines Corp. Differentially modulated avalanche area magnetically sensitive transistor. 4,288,708, Cl. 307-309.000.
Vincent, Michel; Duhault, Jacques; Boullanger, Michelle; and Remond, Georges, to Science Union et Cie. Derivatives of arylalkanoic acids, compositions and use. 4,288,453, Cl. 424-317.000.
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Ellis, Leonard C., 4,288,402, Cl. 422-61.000.
Vogl, Norbert G., Jr.: *See*—
Harroun, Thomas V.; Heller, Lawrence G.; and Vogl, Norbert G., Jr., 4,288,864, Cl. 365-219.000.
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Klein, Gary S., 4,287,846, Cl. 118-212.000.
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Jaccard, Andre R.; and Voss, Karl H., 4,287,642, Cl. 17-25.000.
Voyles, Gerald A., to Emhart Industries, Inc. Solid chip capacitor and method of manufacture. 4,288,842, Cl. 361-433.000.
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Curtin, Larry E., 4,288,015, Cl. 226-97.000.
Morgan, Charles R., 4,288,527, Cl. 430-288.000.
Wabco Westinghouse GmbH: *See*—
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Wagner, Joseph E., III; and Williams, Lloyd E., to J. M. Huber Corporation. Inorganic water-softening bead. 4,288,342, Cl. 252-140.000.
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Wakabayashi, Takao, to Nakanishi Metal Works Co., Ltd. Carrier stopping device for power-and-free conveyor. 4,287,829, Cl. 104-172.00S.
Walchhuetter, Ulrico. Apparatus for coating ceramic tiles or the like to be advanced to roller tunnel kilns. 4,287,849, Cl. 118-602.000.
Wald, Herbert; Young, Harold K.; and Meadows, Lacy C., to Bethlehem Steel Corporation. One side coating of continuous strand. 4,288,476, Cl. 427-300.000.
Walker, Francis H., to Stauffer Chemical Company. Certain N,N'-bistetrahydrofuryl-2-halo-succinamides. 4,288,373, Cl. 260-347.300.
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Wallace, Harry L.; and Thomas, John D., to Burroughs Corporation. Cam operated document stop for high speed item sorter. 4,288,069, Cl. 271-245.000.
Wallace Murray Corporation: *See*—
Zinn, Michael J., 4,288,687, Cl. 235-92.00T.
Waller, Lonnie J.: *See*—
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Wallis, Robert H.: *See*—
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Walsh, John E., to Dartmouth College; and Walsh, John E., part interest to each. Electrical moisture sensor. 4,288,742, Cl. 324-61.00R.
Walters, Ronald G.; and Carlson, Roland W., to Technicare Corporation. Computerized tomographic scanner with shaped radiation filter. 4,288,695, Cl. 250-445.00T.
Waltke, Robert W., to Pennwalt Corporation. Dental casts having vertical adjustments. 4,288,220, Cl. 433-74.000.
Wanderer, Herbert J., to Denver Plastics, Inc. Flexible closures and closure for bung openings. 4,287,996, Cl. 217-108.000.
Wanner, Karl; Reibetanz, Wilbert; Dohse, Hans-Peter; Baumann, Otto; Spiwokz, Dietmar; Seitz, Karl; Angermair, Ernst; and Wiesner, Herbert, to Robert Bosch GmbH. Arrangement for producing grooves. 4,288,187, Cl. 409-180.000.
Ward, George C., to Southwire Company. Continuous casting mold. 4,287,934, Cl. 164-482.000.
Ware, Richard E.: *See*—
Janoski, Edward J.; Schneider, Abraham; and Ware, Richard E., 4,288,644, Cl. 585-360.000.
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Warner, Gordon R. Combined inking and moistening roller. 4,287,827, Cl. 101-141.000.
Wasa, Kiyotaka; Tohda, Takao; Yokoyama, Kazuo; Hirota, Eiichi; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Method of making a magnetic head. 4,288,307, Cl. 204-192.00D.
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Washington, Raymond J. Sack bag holder. 4,287,701, Cl. 53-390.000.
Waskow, Eberhard, to Weserhutte Aktiengesellschaft. Single-roll crusher. 4,288,039, Cl. 241-198.00A.
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Ewing, Lloyd; Redmon, David T.; and Roche, William H., 4,288,395, Cl. 261-122.000.
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Watts, Gilbert E., to J. H. Fenner & Co. Limited. Conveyor belting. 4,288,474, Cl. 427-290.000.
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Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, to Ruhrchemie Aktiengesellschaft. Process for preparing 2,3-dimethylbutene-2. 4,288,643, Cl. 585-324.000.
Weber, Willis W.; Hill, Richard F.; and Weeks, Thomas J., Jr., to Union Carbide Corporation. Apparatus for preparing aluminum alkoxides. 4,288,410, Cl. 422-233.000.
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Weidner, Barry. Tree transplanting method and apparatus therefor. 4,287,840, Cl. 111-1.000.
Weil, Thomas L., to Bentley-Harris Manufacturing Company. Bulky composite fabric and method of making same. 4,287,844, Cl. 112-412.000.
Weinhaus, Robert S. Magnetically secured display apparatus. 4,287,676, Cl. 40-10.00R.
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Weisbrich, Alfred L. TARP Yaw track means for rotors. 4,288,199, Cl. 415-2.00R.
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Weyns, Arthur, to Siemens Aktiengesellschaft. Method for the manufacture of ultrasonic transducers. 4,287,770, Cl. 73-632.000.

Wheatley, David S.: *See*—
Blore, Peter D.; and Wheatley, David S., 4,288,279, Cl. 156-498.000.

Whirlpool Corporation: *See*—
Buchser, William J.; Tate, Ralph; and Haag, Charles W., 4,288,135, Cl. 312-296.000.
Morrison, Russell J., 4,288,671, Cl. 200-304.000.

White Consolidated Industries, Inc.: *See*—
Goins, James R.; and Cardin, Hubert H., 4,287,873, Cl. 126-194.000.

White, Lionel S., Jr.: *See*—
Reese, Edmund A.; White, Lionel S., Jr.; and McAlexander, Joseph C., III, 4,288,706, Cl. 307-577.000.

Whitehead Motofides, S.p.A.: *See*—
Nardi, Giovanni, 4,288,117, Cl. 292-52.000.

Whitford, Darryl R., to Flinders University of South Australia, The; and Minister of Transport, State of South Australia, The. Modular motor and control means and method. 4,288,727, Cl. 318-112.000.

Whitman, William C. Heat storage apparatus. 4,287,942, Cl. 165-104.140.

Whittaker Corporation: *See*—
Cisco, Terry C.; and Grimaila, Algert G., 4,288,291, Cl. 176-19.00R.

Whittaker, Graham: *See*—
Roberts, Norman L.; and Whittaker, Graham, 4,288,600, Cl. 546-345.000.

Wiand, Ronald C. Abrasive pads for lens lapping tools. 4,288,233, Cl. 51-295.000.

Wiberg, Leif: *See*—
Blom, Hans; and Wiberg, Leif, 4,288,653, Cl. 174-47.000.
Blom, Hans; and Wiberg, Leif, 4,288,654, Cl. 174-47.000.

Widell, Stig G.: *See*—
Foll, Ake L.; and Widell, Stig G., 4,288,428, Cl. 424-78.000.

Widmer, Gerald: *See*—
Widmer, Gerald L.; Gray, Larry J.; and Pardee, Richard H., 4,288,034, Cl. 239-168.000.

Widmer, Gerald L.; Gray, Larry J.; and Pardee, Richard H., to Widmer, Gerald. Boom shock and tilt system. 4,288,034, Cl. 239-168.000.

Wiechert, Edelbert, to Siemens Aktiengesellschaft. Transport car, particularly for transporting files, with frontally arranged bumper. 4,288,121, Cl. 293-4.000.

Wiedemann, Fritz: *See*—
Friebe, Walter-Gunar; Michel, Helmut; Ross, Carl H.; Wiedemann, Fritz; Sponer, Gisbert; and Schaumann, Wolfgang, 4,288,442, Cl. 424-267.000.

Wieder, Wolfgang; and Witte, Josef, to Bayer Aktiengesellschaft. Alternating isoprene-ethylene copolymers and a process for the preparation thereof. 4,288,581, Cl. 526-169.200.

Wieland-Werke Aktiengesellschaft: *See*—
Egerer, Rudolf, 4,287,658, Cl. 29-509.000.

Wier, Jack E.: *See*—
Egli, Werner H.; Kuhlmann, Dennis; and Wier, Jack E., 4,287,809, Cl. 89-41.0EA.

Wiesner, Herbert: *See*—
Wanner, Karl; Reibetanz, Wilbert; Dohse, Hans-Peter; Baumann, Otto; Spiwokz, Dietmar; Seitz, Karl; Angermair, Ernst; and Wiesner, Herbert, 4,288,187, Cl. 409-180.000.

Wiggins Teape Group Limited, The: *See*—
Allen, Roger A.; Inglis, Bruce R.; and Green, Kieron P., 4,287,981, Cl. 198-457.000.

Wijts, Corneel C.: *See*—
Persoons, Gustaaf M.; and Wijts, Corneel C., 4,287,707, Cl. 56-12.800.

Wilhelm Dahle Buro- und Zeichengeratefabrik: *See*—
Dahle, Gerald, 4,288,019, Cl. 227-144.000.

Wilhelm, Thomas D., to American Can Company. Container structure. 4,288,026, Cl. 229-1.50B.

Wilkes, William W., to Fiber Industries, Inc. Apparatus for producing melt-spun filaments. 4,288,207, Cl. 425-72.00S.

Will, Fritz G., to General Electric Company. Insulating porous matrices for electrode boilers. 4,288,683, Cl. 219-290.000.

William H. Rorer, Inc.: *See*—
Diamond, Julius, 4,288,457, Cl. 424-353.000.

Williams, Alan R.: *See*—
Reynolds, James E.; and Williams, Alan R., 4,288,414, Cl. 423-79.000.

Williams, Lloyd E.: *See*—
Wagner, Joseph E., III; and Williams, Lloyd E., 4,288,342, Cl. 252-140.000.

Williams, Robert M. Waste material processing apparatus. 4,288,038, Cl. 241-52.000.

Williams, Robert T. Multi-field imaging device. 4,288,819, Cl. 358-226.000.

Williams, Thomas N.: *See*—
Horn, James M.; Johnston, Byron E.; Napier, Roger P.; and Williams, Thomas N., 4,288,392, Cl. 260-983.000.

Wilsberg, Heinz-Manfred, to Henkel Kommanditgesellschaft auf Aktien. Spray cleaner composition for the spot treatment of textiles before washing. 4,288,339, Cl. 252-90.000.

Wilson, Albert, to Litton Systems, Inc. Vibrating screen with screen deck unclogging mechanism. 4,288,320, Cl. 209-382.000.

Wilson, Gregory S., to United Technologies Corporation. Vane cooling structure. 4,288,201, Cl. 415-115.000.

Wilson, Hugh R. Variable work holding device for grinding gemstones. 4,287,687, Cl. 51-229.000.

Wilson, James W. A.; and Steigerwald, Robert L., to General Electric Company. Forced commutated starting circuit for load commutated inverter drive system. 4,288,732, Cl. 318-723.000.

Wilson, Robert E.: *See*—
Osborne, Gregory W.; Ripley, William C.; and Wilson, Robert E., 4,288,794, Cl. 343-708.000.

Wilterding, Jack E.; and Cozzens, John J., to United States of America, Air Force. Digital integrating/auto-correlator apparatus. 4,288,857, Cl. 364-728.000.

Winstead, Thomas W., to Maryland Cup Corporation. Method for the continuous formation of biaxially oriented thermoplastic materials and forming articles therefrom by intermittent forming means interfaced therewith. 4,288,400, Cl. 264-210.100.

Wissner, Allan; and Floyd, Middleton B., Jr., to American Cyanamid Company. 1-Hydroxymethyl-11-deoxy-15-hydroxy-prosten-1-ol-derivatives. 4,288,629, Cl. 568-330.000.

Wissner, Allan; and Floyd, Middleton B., Jr., to American Cyanamid Company. 1-Hydroxymethyl-11,15-dihydroxy-prosten-1-ol-derivatives. 4,288,630, Cl. 568-330.000.

Wissner, Allan; and Floyd, Middleton B., Jr., to American Cyanamid Company. 1-Hydroxymethyl-11,16-dihydroxy-prosten-1-ol derivatives. 4,288,632, Cl. 568-367.000.

Wissner, Allan; and Floyd, Middleton B., Jr., to American Cyanamid Company. 1-Hydroxymethyl-11-deoxy-16-hydroxy-prosten-1-ol-derivatives. 4,288,633, Cl. 568-367.000.

Wisyanski, Thomas W., to Century Brass Products, Inc. Control valve assembly. 4,288,033, Cl. 236-93.00A.

Witte, Josef: *See*—
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Wittmann, Heinz; and Himmetsberger, Alois, to TMC Corporation. Safety ski binding. 4,288,095, Cl. 280-625.000.

Woebcke, Herman N.: *See*—
Gartside, Robert J.; and Woebcke, Herman N., 4,288,235, Cl. 55-196.000.

Woerner, Douglas C.: *See*—
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Wohlwend, Ernst: *See*—
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Wolf, Heinz: *See*—
Staab, Joachim; Apel, Willy; and Wolf, Heinz, 4,287,764, Cl. 73-431.000.

Wolfe, Jerome K.: *See*—
Patel, Jayant M.; Wolfe, Jerome K.; Coyle, Forrest E.; and Farley, James R., 4,288,667, Cl. 200-48.00R.

Wolfthal, Maurice, to Stewart Stamping Corp. Rotary transfer press apparatus. 4,287,748, Cl. 72-405.000.

Wolter, Gilbert R., to Sunbeam Corporation. Hair dryer diffuser. 4,287,673, Cl. 34-97.000.

Wong, James K. C. Tire traction device. 4,287,926, Cl. 152-225.00C.

Woodell, Jack L.: *See*—
Bieber, Larry C.; and Woodell, Jack L., 4,288,658, Cl. 178-3.000.

Wootton, Roy E., to Electric Power Research Institute, Inc. Dielectric gas selected from binary mixtures of SF_6, SO_2 and CF_3CFCF_2. 4,288,651, Cl. 174-17.0GF.

Worm, Manfred: *See*—
Martin, Lawrence L.; and Worm, Manfred, 4,288,623, Cl. 564-307.000.

Worrell, Wayne L.: *See*—
Basu, Samarnath; and Worrell, Wayne L., 4,288,508, Cl. 429-218.000.

Worthy, Howard G. Fuel feeding system for aircraft. 4,287,907, Cl. 137-255.000.

Wright, Michael J., to Newage Engineers Limited. Control systems for electric generators. 4,288,736, Cl. 322-28.000.

Wright, Paul L.: *See*—
Livesay, Richard E.; and Wright, Paul L., 4,288,172, Cl. 403-317.000.

Wu, Charles Tung-ming: *See*—
Lee, Chen Yi; Wu, Charles Tung-ming; Brooks, Mark A.; and Fallis, Robert E., 4,288,835, Cl. 361-283.000.

Wulf, Helmut: *See—*
Braun, Dieter; Mehren, Herbert; and Wulf, Helmut, 4,287,830, Cl. 104-247.000.

Wunder, Friedrich: *See—*
Schmidt, Hans-Joachim; Wunder, Friedrich; Arpe, Hans-Jurgen; and Leupold, Ernst I., 4,288,558, Cl. 518-716.000.

Wyler, Siegfried: *See—*
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Xerox Corporation: *See—*
Gaudioso, Stephen L., 4,288,516, Cl. 430-107.000.
Lavallee, Pierre A.; and Stoffel, James C., 4,288,821, Cl. 358-293.000.
Ronen, Ram S., 4,288,801, Cl. 357-41.000.
Ronen, Ram S., 4,288,802, Cl. 357-41.000.
Ronen, Ram S., 4,288,803, Cl. 357-41.000.
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Thornburg, David D.; and Rosen, Brian, 4,288,836, Cl. 361-288.000.

Yabe, Toyoji, to Sony Corporation. Television receiver apparatus for selectively displaying a video picture or alphanumeric data information. 4,288,809, Cl. 358-12.000.

Yaginuma, Satoshi: *See—*
Fujii, Tadashiro; Yaginuma, Satoshi; Muto, Naoki; and Hayashi, Mitsuo, 4,288,429, Cl. 424-117.000.

Yakovlev, Grigory P.: *See—*
Selivanov, Anatoly G.; Yakovlev, Grigory P.; Khodyrev, Vladimir I.; and Zhivetin, Valery V., 4,287,674, Cl. 34-201.000.

Yamabe, Taiji: *See—*
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Yamada, Hirozi: *See—*
Umezaki, Hiroshi; Nishida, Hideki; Tsumita, Norikazu; Yamada, Hirozi; Kaneko, Katsuhiro; and Koiso, Nagatugu, 4,288,283, Cl. 156-643.000.

Yamada, Kunihiro, to Ricoh Co., Ltd. Timing data reproduction system. 4,288,874, Cl. 375-118.000.

Yamada, Norio: *See—*
Kubo, Shinji; and Yamada, Norio, 4,287,760, Cl. 73-149.000.

Yamada, Shigeyasu; Kawamura, Kazumi; and Nakamura, Shuji, to NGK Spark Plug Co., Ltd. Spark plug for internal combustion engine. 4,288,714, Cl. 313-142.000.

Yamada, Tominori: *See—*
Fujiwara, Minoru; Yamada, Tominori; and Tamura, Tstsuji, 4,287,790, Cl. 74-665.0GB.

Yamaguchi, Masatsugu: *See—*
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Yamaguchi, Osamu: *See—*
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Yamamoto, Haruo. Fermentative process for preparing antibiotics of the gentamicin class. 4,288,547, Cl. 435-80.000.

Yamamoto, Masataka: *See—*
Hisazumi, Nobuyuki; Yamamoto, Masataka; and Uehara, Tsutomu, 4,288,488, Cl. 428-214.000.

Yamamoto, Ryuji; Nakahara, Fukumori; and Kasai, Tadao, to Soundesign Corporation. Apparatus for and method of distinguishing pauses to control selective replay in tape recording/reproduction systems. 4,288,823, Cl. 360-73.000.

Yamamoto, Shigeru, to Daiwa Seiko, Inc. Fishing rod line guide. 4,287,678, Cl. 43-24.000.

Yamamoto, Toshio; and Yuge, Shizuo, to Minolta Camera Kabushiki Kaisha. Magnetic brush developing apparatus. 4,287,850, Cl. 118-657.000.

Yamanaka, Tohr; and Imai, Takashi, to Takasago Perfumery Co., Ltd. Production of ω-alkene-1-ols. 4,288,642, Cl. 568-903.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; Homma, Hiroshige; and Murakami, Masuo, 4,288,438, Cl. 424-251.000.

Yamashita, Keitaro; and Noguchi, Kohji, to Hitachi Metals, Ltd. Process for reversal development using inductively chargeable magnetic powdery developer. 4,288,515, Cl. 430-100.000.

Yamashita, Riichiro: *See—*
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Yamashita, Shigeo: *See—*
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Yamashita, Toshiharu, to Hoya Corporation. Glass filter for contrast enhancement in CRT displays. 4,288,250, Cl. 501-78.000.

Yanagiuchi, Yukihiro: *See—*
Senno, Harufumi; Sakakima, Hiroshi; Yanagiuchi, Yukihiro; Inoue, Tsuneo; Yamaguchi, Masatsugu; and Hirota, Eiichi, 4,288,260, Cl. 148-121.000.

Yardley Products Corp.: *See—*
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Yarway Corporation: *See—*
Hetz, Heinz K., 4,288,032, Cl. 236-56.000.

Yasuda, Eturo; Segawa, Yoshihiro; and Ohta, Minoru, to Nippon Soken, Inc. Gas detector. 4,287,751, Cl. 73-23.000.

Yeda Research & Development Co., Ltd.: *See—*
Avigal, Yitzchak; Manassen, Joost; Hodes, Gary; and Cahen, David, 4,288,502, Cl. 429-111.000.

Yellow Springs Instrument Company, Inc., The: *See—*
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Yokohama Rubber Co., Ltd., The: *See—*
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Yokomichi, Isao: *See—*
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Yokota, Hideo: *See—*
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Yokota, Hirakazu: *See—*
Sakata, Shinji; Yokota, Hirakazu; Shimizu, Tasuku; and Otawara, Yasuhiko, 4,288,677, Cl. 219-121.0ED.

Yokota, Tethuya: *See—*
Ukai, Nobuo; Funado, Akira; and Yokota, Tethuya, 4,287,821, Cl. 99-646.00C.

Yokota, Yukio: *See—*
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Yokoyama, Kazuo: *See—*
Wasa, Kiyotaka; Tohda, Takao; Yokoyama, Kazuo; Hirota, Eiichi; and Hayakawa, Shigeru, 4,288,307, Cl. 204-192.00D.

Yonemura, Katsutoshi: *See—*
Sekiguchi, Hideki; Miyoshi, Michizo; and Yonemura, Katsutoshi, 4,288,393, Cl. 261-108.000.

Yoshida, Ikio; Kage, Kouzou; Ikeda, Kazuhiro; and Sato, Yasuo, to Nippon Electric Co., Ltd. Wave translating circuit. 4,288,751, Cl. 328-173.000.

Yoshida Kogyo K. K.: *See—*
Matsubara, Isamu; and Hayashi, Moriyoshi, 4,287,697, Cl. 52-403.000.
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Yoshida Kogyo, K.K.: *See—*
Kanzaka, Yoshihiro, 4,287,646, Cl. 24-205.14R.

Yoshida, Takashi; Matsuyama, Takeshi; Kuki, Tamaki; and Kodaka, Takayuki, to Nippon Gakki Seizo Kabushiki Kaisha. Junction field effect transistor. 4,288,800, Cl. 357-22.000.

Yoshida, Tetsu; and Higashikawa, Katsunori, to Toshiba Kikai Kabushiki Kaisha. Machine tool control systems. 4,288,849, Cl. 364-102.000.

Yoshikumi, Chikao; Wada, Toshihiko; Makita, Himromitsu; and Suzuki, Kinzaburo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for the cultivation of Basidiomycetes. 4,288,555, Cl. 435-254.000.

Yoshimoto, Hiromu; Okumura, Michitoshi; and Kawate, Kenji. Method for the heat treatment of aluminum strip. 4,288,261, Cl. 148-131.000.

Yoshinaga, Sadao, to Prince Industrial Development Co., Ltd. Gas cigarette lighter with solar cell. 4,288,209, Cl. 431-255.000.

Yoshino Kogyosho Co., Ltd.: *See—*
Kinoshita, Harumi; Hayashi, Yoshiaki; and Saito, Tadao, 4,288,478, Cl. 428-35.000.

Young, Daniel P.: *See—*
Garritsen, Petrus G. S.; MacVicar, Douglas J.; Young, Daniel P.; and Sojda, John G., 4,288,305, Cl. 204-112.000.

Young, Donald L.: *See—*
United States of America, National Aeronautics and Space Administration; Moynihan, Philip I.; and Young, Donald L., 4,287,838, Cl. 110-234.000.

Young, Harold K.: *See—*
Wald, Herbert; Young, Harold K.; and Meadows, Lacy C., 4,288,476, Cl. 427-300.000.

Youngdale, Gilbert A., to Upjohn Company, The. Pyridinones. 4,288,440, Cl. 424-263.000.

Yu, Hwa N.: *See—*
Ning, Tak H.; Osburn, Carlton M.; and Yu, Hwa N., 4,288,256, Cl. 148-1.500.

Yuge, Shizuo: *See—*
Yamamoto, Toshio; and Yuge, Shizuo, 4,287,850, Cl. 118-657.000.

Zahir, Abdul-Cader; and Wyler, Siegfried, to Ciba-Geigy Corporation. Curable mixtures based on maleimides and 1-propenyl-substituted phenols. 4,288,583, Cl. 526-262.000.

Zehnder, Jurg; and Neumeier, Erich, to Swiss Aluminium Ltd. Stops of a draft gear housing of a rail car central coupler arranged in a center sill. 4,287,834, Cl. 105-420.000.

Zeindler, Stephan; and Suss, Hans G., to Inventio AG. Apparatus for placing in order the servicing sequence of storey calls of elevator systems. 4,288,859, Cl. 364-900.000.

Zema, Fred. Electric mouth organ holder. 4,287,803, Cl. 84-1.060.

Zenith Radio Corporation: *See—*
Blacker, Allen P.; and Ingle, Arthur J., 4,288,718, Cl. 313-414.000.

Zenker, Walter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Transmission with double friction clutch. 4,287,781, Cl. 74-375.000.

Zestermann, Mary J.; and Hussar, John F., to Carstab Corporation. Substituted oxazolines as stabilizers. 4,288,361, Cl. 260-45.8NZ.

Zhivetin, Valery V.: *See—*
Selivanov, Anatoly G.; Yakovlev, Grigory P.; Khodyrev, Vladimir I.; and Zhivetin, Valery V., 4,287,674, Cl. 34-201.000.

Ziaylek, Theodore, Jr., to Yardley Products Corp. Threaded insert. 4,288,189, Cl. 411-180.000.

Zimmermann, John, to Somerville Belkin Industries Limited. Dew worm carton. 4,287,998, Cl. 229-16.00R.

Zink, Rudolf: *See—*
Loew, Peter; and Zink, Rudolf, 4,288,589, Cl. 542-466.000.

Zinn, Michael J., to Wallace Murray Corporation. Multipoint digital tachograph. 4,288,687, Cl. 235-92.00T.

Zinser Textilmaschinen GmbH, Firma: *See—*
Hartmannsgruber, Max; Nigg, Egon; and Hack, Kurt, 4,287,711, Cl. 57-130.000.

Znamirowski, Henry; and Roles, David J., to Roper Corporation. Metal cabinet for assembly by the user from knocked-down condition. 4,288,132, Cl. 312-257.00R.

Zoecon Corporation: *See—*
Kohn, Gustave K.; and Baer, Ted A., 4,288,621, Cl. 564-190.000.

Zotti, Aldo; and Cardini, Giuliano, to Euteco Impianti S.p.A. Process for the cultivation of yeast cells. 4,288,554, Cl. 435-247.000.

Zucker, Yehuda. Electronic theft prevention apparatus for vehicles. 4,288,778, Cl. 340-64.000.

Zur, Henry C. Multi-feature and variable function body supporting assembly and sideguards. 4,287,620, Cl. 5-68.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF SEPTEMBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Albrecht, Konrad: *See*—
Frensch, Heinz; Albrecht, Konrad; and Taubel, Norbert, Re. 30,740, Cl. 424-276.000.

Aoki, Eiichiro: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, Re. 30,736, Cl. 84-1.110.

Beecham Group Limited: *See*—
Gardner, Derek V., Re. 30,739, Cl. 260-345.200.

Boeing Company, The: *See*—
Ihlenfeldt, Eugene T.; and Marshall, David E., Re. 30,735, Cl. 73-361.000.

Bridges, Jack; and Taflove, Allen, to IIT Research Institute. Apparatus and method for in situ heat processing of hydrocarbonaceous formations. Re. 30,738, Cl. 166-248.000.

Caron, La Verne A., to Chrysler Corporation. Electronic circuit for use in a variety of engine control systems. Re. 30,737, Cl. 123-415.000.

Chrysler Corporation: *See*—
Caron, La Verne A., Re. 30,737, Cl. 123-415.000.

DLM, Inc.: *See*—
Eckert, Ronald P., Re. 30,734, Cl. 40-497.000.

Eckert, Ronald P., to DLM, Inc. Revolving self-service display stand. Re. 30,734, Cl. 40-497.000.

Frensch, Heinz; Albrecht, Konrad; and Taubel, Norbert, to Hoechst Aktiengesellschaft. Insecticidal composition for ultra low volume application. Re. 30,740, Cl. 424-276.000.

Gardner, Derek V., to Beecham Group Limited. Anorexic chromans. Re. 30,739, Cl. 260-345.200.

Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Tone wave generator in electronic musical instrument. Re. 30,736, Cl. 84-1.110.

Hoechst Aktiengesellschaft: *See*—
Frensch, Heinz; Albrecht, Konrad; and Taubel, Norbert, Re. 30,740, Cl. 424-276.000.

Ihlenfeldt, Eugene T.; and Marshall, David E., to Boeing Company, The. Automatic thermocouple reference junction compensator. Re. 30,735, Cl. 73-361.000.

IIT Research Institute: *See*—
Bridges, Jack; and Taflove, Allen, Re. 30,738, Cl. 166-248.000.

Marshall, David E.: *See*—
Ihlenfeldt, Eugene T.; and Marshall, David E., Re. 30,735, Cl. 73-361.000.

Nakada, Akira: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, Re. 30,736, Cl. 84-1.110.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, Re. 30,736, Cl. 84-1.110.

Okumura, Takatoshi: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, Re. 30,736, Cl. 84-1.110.

Quenot, Michel, to Stanley-Mabo S.A. Blade-holding cutting device. Re. 30,733, Cl. 30-162.000.

Stanley-Mabo S.A.: *See*—
Quenot, Michel, Re. 30,733, Cl. 30-162.000.

Suzuki, Tsutomu: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, Re. 30,736, Cl. 84-1.110.

Taflove, Allen: *See*—
Bridges, Jack; and Taflove, Allen, Re. 30,738, Cl. 166-248.000.

Taubel, Norbert: *See*—
Frensch, Heinz; Albrecht, Konrad; and Taubel, Norbert, Re. 30,740, Cl. 424-276.000.

LIST OF DESIGN PATENTEES

Akazawa, Toshimasa; Ohta, Kikuo; Igo, Toshio; and Mishiro, Benito, to Matsushita Electric Industrial Co., Ltd. Combined radio, clock and calculator. 260,646, 9-8-81, Cl. D14-73.000.

Albinson, Don C., to Westinghouse Electric Corp. Chair. 260,584, 9-8-81, Cl. D6-69.000.

Alviti, Steven A., to Bel-Air Tool Corp. Vibratory finishing machine. 260,650, 9-8-81, Cl. D15-147.000.

Ament, Donald S.; and Ament, Duane S., to Miracle Recreation Equipment Company. Playground swing. 260,673, 9-8-81, Cl. D21-246.000.

Ament, Duane S.: *See*—
Ament, Donald S.; and Ament, Duane S., 260,673, Cl. D21-246.000.

American Cyanamid Company: *See*—
Grip, John A., 260,610, Cl. D9-413.000.
Hines, Robert, 260,691, Cl. D28-8.100.

American Home Products Corp.: *See*—
Stoy, Raymond P., 260,607, Cl. D9-389.000.

American Standard Inc.: *See*—
Hiller, Dorothee, 260,678, Cl. D23-53.000.

AMFESCO Industries, Inc.: *See*—
Greenblatt, David; and Spinoza, Rick, 260,571, Cl. D2-321.000.
Greenblatt, David; and Spinoza, Rick, 260,572, Cl. D2-321.000.

Antonelli, Luciano, to F. lli Antonelli s.n.c. del. Cav. Luigi Antonelli & C. Electronic organ. 260,654, 9-8-81, Cl. D17-6.000.

Appel, Mel; and Kress, George, to Appel, Mel. Lunch box. 260,595, 9-8-81, Cl. D7-76.000.

Arai, Noriyuki: *See*—
Saeki, Taisuke; Katayama, Masaharu; Kitakaze, Yoshinobu; Arai, Noriyuki; Takahashi, Hideo; Kurokawa, Koya; and Shimose, Norihiko, 260,647, Cl. D14-78.000.

Armstrong, Jerry A., to Super Hooper Corporation. Basketball return for attachment to basketball hoops. 260,669, 9-8-81, Cl. D21-201.000.

Armstrong, Jerry A., to Super Hooper Corporation. Basketball return for attachment to basketball hoops. 260,670, 9-8-81, Cl. D21-201.000.

Atrio, George. Decorative electric lamp. 260,686, 9-8-81, Cl. D26-99.000.

Atrio, George. Decorative electric lamp. 260,687, 9-8-81, Cl. D26-99.000.

Balcells, Jose L., to Conqueror (Wine & Spirit) & Co., Limited. Bottle. 260,611, 9-8-81, Cl. D9-413.000.

Ball Corporation: *See*—
McKee, James R., Jr., 260,608, Cl. D9-394.000.

Barbera, Charles. Loudspeaker enclosure. 260,638, 9-8-81, Cl. D14-33.000.

Barr, Josef J. Clasp earring. 260,622, 9-8-81, Cl. D11-75.000.

Baudon, Maurice C., to S. A. ets Lardenois. Brush head and handle. 260,579, 9-8-81, Cl. D4-35.000.

Bel-Air Tool Corp.: *See*—
Alviti, Steven A., 260,650, Cl. D15-147.000.

Berkline Corporation, The: *See*—
Long, Stapleton, 260,585, Cl. D6-71.000.

Blum, Pierre-Alain, to Interdica S.A. Combined lockable bracelet and key therefor. 260,620, 9-8-81, Cl. D11-3.000.

Bowls, Thurman: *See*—
Wotowiec, Joseph P.; and Bowls, Thurman, 260,688, Cl. D26-142.000.

Bowman Construction Supply, Inc.: *See*—
Bowman, William E., 260,684, Cl. D25-74.000.

Bowman, William E., to Bowman Construction Supply, Inc. Expansion joint sealing strip for roadway joints. 260,684, 9-8-81, Cl. D25-74.000.

Brewer, William R. Chair for invalids. 260,583, 9-8-81, Cl. D6-64.000.

Brown, Fred W., Jr. Roller skate carrier. 260,575, 9-8-81, Cl. D3-36.000.

Bulgari, Marina, to Zoldia Anstalt. Segmental necklace. 260,621, 9-8-81, Cl. D11-5.000.

Bullard, Edmund P., Sr.; and Togni, Gary A. Wood burning stove. 260,680, 9-8-81, Cl. D23-97.000.

C + D Consulting & Design AG: *See*—
Luthy, Ernst, 260,582, Cl. D6-63.000.

Campbell, Bruce B.; and Milliser, Charles E., to General Electric Company. Cabinet for an input-output terminal for a data handling system. 260,641, 9-8-81, Cl. D14-105.000.

Century Products, Inc.: *See*—
Meeker, Paul K., 260,580, Cl. D6-10.000.

Chiba, Shigeki, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Fountain pen. 260,658, 9-8-81, Cl. D19-49.000.

Ching Wah Metal Ware Factory Limited: *See*—
Wong, Siu W., 260,599, Cl. D8-82.000.

Chodorow, Ingram S.; and Dainow, J. David, to Technalytics, Inc. Retention suture bridge. 260,681, 9-8-81, Cl. D24-27.000.

Chrysler Corporation: *See*—
Duden, George K., 260,636, Cl. D13-15.000.
Clarence Controls Inc.: *See*—
Lockwood, David L., 260,635, Cl. D13-4.000.
Clarion Co. Ltd.: *See*—
Kikuhara, Toshiyoshi, 260,644, Cl. D14-68.000.
Kikuhara, Toshiyoshi, 260,645, Cl. D14-70.000.
Collister, Kenneth D.; and Flood, James R., to Miles Laboratories, Inc. Form printer. 260,642, 9-8-81, Cl. D14-111.000.
Comma, Sandra M. Plural mount picture frame. 260,592, 9-8-81, Cl. D6-234.000.
Conqueror (Wine & Spirit) & Co., Limited: *See*—
Balcells, Jose L., 260,611, Cl. D9-413.000.
Courreges, Andre. Bottle. 260,609, 9-8-81, Cl. D9-403.000.
Cox, Philip A. Portable expanding file case. 260,578, 9-8-81, Cl. D3-52.000.
Dainow, J. David: *See*—
Chodorow, Ingram S.; and Dainow, J. David, 260,681, Cl. D24-27.000.
Dart Industries Inc.: *See*—
Wondergem, M. James, 260,649, Cl. D15-105.000.
Design Innovations: *See*—
Dolinar, Kevin D.; Lipsitz, Ruth M.; and Lipsitz, Barry R., 260,593, Cl. D6-264.000.
Dolinar, Kevin D.; Lipsitz, Ruth M.; and Lipsitz, Barry R., to Design Innovations. Bed sheet or similar article. 260,593, 9-8-81, Cl. D6-264.000.
Drafton, Thomas L. Overhead console for vehicles. 260,630, 9-8-81, Cl. D12-155.000.
Duden, George K., to Chrysler Corporation. Housing for an electronic ignition control unit. 260,636, 9-8-81, Cl. D13-15.000.
Eischen, Clement G., Sr. Relaxation pad. 260,591, 9-8-81, Cl. D6-201.000.
F. lli Antonelli s.n.c. del. Cav. Luigi Antonelli & C.: *See*—
Antonelli, Luciano, 260,654, Cl. D17-6.000.
Flood, James R.: *See*—
Collister, Kenneth D.; and Flood, James R., 260,642, Cl. D14-111.000.
Foggia, Donald; and Pomponi, Roman, to TIE/Communications, Inc. Base for a telephone set. 260,643, 9-8-81, Cl. D14-60.000.
Four Star Corporation: *See*—
Kowalski, Daniel J., 260,631, Cl. D12-15
Friedrich Grohe Armaturenfabrik: *See*—
Thevenot, Gilles, 260,677, Cl. D23-32.000.
Funahashi, Tatsuro, to Shachihata Industrial Co., Ltd. Felt pen. 260,656, 9-8-81, Cl. D19-43.000.
Funahashi, Tatsuro, to Shachihata Industrial Co., Ltd. Felt pen. 260,657, 9-8-81, Cl. D19-43.000.
Gardner, Bob E. Combined golf ball marker and card holder. 260,672, 9-8-81, Cl. D21-234.000.
Gates, John I., to Oliver, Clifford C., a part interest. Porthole. 260,634, 9-8-81, Cl. D12-183.000.
General Electric Company: *See*—
Campbell, Bruce B.; and Milliser, Charles E., 260,641, Cl. D14-105.000.
Wilkerson, Harold E., 260,612, Cl. D9-424.000.
Wilkerson, Harold E., 260,613, Cl. D9-424.000.
Wotowiec, Joseph P.; and Bowls, Thurman, 260,688, Cl. D26-142.000.
Gibbons, Robert R., to Insulation Technology Corporation. Hopper for an insulation blowing machine and the like. 260,651, 9-8-81, Cl. D15-199.000.
Goodyear Tire & Rubber Company, The: *See*—
Hammond, Philip S., 260,629, Cl. D12-142.000.
Gorman, Ronald D. Service box for a pickup truck. 260,633, 9-8-81, Cl. D12-157.000.
Gorski, Richard S. Statue. 260,623, 9-8-81, Cl. D11-157.000.
Greenblatt, David; and Spinoza, Rick, to AMFESCO Industries, Inc. Sole of a shoe. 260,571, 9-8-81, Cl. D2-321.000.
Greenblatt, David; and Spinoza, Rick, to AMFESCO Industries, Inc. Sole of a shoe. 260,572, 9-8-81, Cl. D2-321.000.
Grip, John A., to American Cyanamid Company. Combined bottle and cap. 260,610, 9-8-81, Cl. D9-413.000.
Grove Foods, Inc.: *See*—
Perlmutter, R. Michel, 260,587, Cl. D6-146.000.
Groves, Richard A. Adjustable carpenters square. 260,616, 9-8-81, Cl. D10-65.000.
Guay, Germaine. Musical spoon. 260,655, 9-8-81, Cl. D17-22.000.
Guillon, Smith, Marquart & Asso. Ltd.: *See*—
Smith, Morley L., Jr., 260,627, Cl. D12-91.000.
Hammond, Philip S., to Goodyear Tire & Rubber Company, The. Tire tread and buttress. 260,629, 9-8-81, Cl. D12-142.000.
Harrigan, Donald R. Photographic printing apparatus. 260,653, 9-8-81, Cl. D16-27.000.
Hida, Hiroyuki, to Mitsubishi Pencil Co. Ltd. Toy construction piece. 260,662, 9-8-81, Cl. D21-108.000.
Hiller, Dorothee, to American Standard Inc. Lavatory or similar article. 260,678, 9-8-81, Cl. D23-53.000.
Hines, Robert, to American Cyanamid Company. Soap bar or similar article. 260,691, 9-8-81, Cl. D28-8.100.
Hiraishi, Etsuo; and Sakamoto, Masakazu, to Ryobi Ltd. Fishing rod grip. 260,675, 9-8-81, Cl. D22-23.000.
Hiraishi, Etsuo; and Sakamoto, Masakazu, to Ryobi Ltd. Fishing rod grip. 260,676, 9-8-81, Cl. D22-23.000.
Hobson, Haydn H. Corner guard for furniture. 260,590, 9-8-81, Cl. D6-191.000.
Hollenbeck, Leroy F., Jr., to Perko, Inc. Boat safety main switch. 260,637, 9-8-81, Cl. D13-32.000.
Honeywell Inc.: *See*—
Lawson, Phillip N., II; and Odom, James A., Jr., 260,617, Cl. D10-76.000.
Igo, Toshio: *See*—
Akazawa, Toshimasa; Ohta, Kikuo; Igo, Toshio; and Mishiro, Benito, 260,646, Cl. D14-73.000.
Impastato, Leona R. Combined tracing wheel and marking tool for dressmaking. 260,573, 9-8-81, Cl. D3-18.000.
Insulation Technology Corporation: *See*—
Gibbons, Robert R., 260,651, Cl. D15-199.000.
Interdica S.A.: *See*—
Blum, Pierre-Alain, 260,620, Cl. D11-3.000.
John J. Madison Company, Inc.: *See*—
Santa Eulalia, Jesus A. C.; and Santa Eulalia, Javier B. C., 260,624, Cl. D11-158.000.
Johnson, Kenneth E., Sr., to T-Shirts Plus, Inc. Storage cabinet. 260,588, 9-8-81, Cl. D6-153.000.
Kabushiki Kaisha Bandai Overseas: *See*—
Yamashina, Naoharu, 260,663, Cl. D21-134.000.
Yamashina, Naoharu, 260,664, Cl. D21-134.000.
Yamashina, Naoharu, 260,665, Cl. D21-136.000.
Kadar, Gabor. Novelty figurine. 260,626, 9-8-81, Cl. D11-160.000.
Katayama, Masaharu: *See*—
Saeki, Taisuke; Katayama, Masaharu; Kitakaze, Yoshinobu; Arai, Noriyuki; Takahashi, Hideo; Kurokawa, Koya; and Shimose, Norihiko, 260,647, Cl. D14-78.000.
Kawaguchi, Yasuji, to Kubota, Ltd. Lifting hook. 260,601, 9-8-81, Cl. D8-367.000.
Kikuhara, Toshiyoshi, to Clarion Co. Ltd. Automobile radio receiver. 260,644, 9-8-81, Cl. D14-68.000.
Kikuhara, Toshiyoshi, to Clarion Co. Ltd. Automobile radio receiver. 260,645, 9-8-81, Cl. D14-70.000.
Kirkland, Walter D. Hand-held homogenizer. 260,652, 9-8-81, Cl. D15-199.000.
Kitakaze, Yoshinobu: *See*—
Saeki, Taisuke; Katayama, Masaharu; Kitakaze, Yoshinobu; Arai, Noriyuki; Takahashi, Hideo; Kurokawa, Koya; and Shimose, Norihiko, 260,647, Cl. D14-78.000.
Kokoska, Vera. Folding cabinet step. 260,683, 9-8-81, Cl. D25-65.000.
Koslar, Manfred. Electrical testing instrument. 260,618, 9-8-81, Cl. D10-78.000.
Koslar, Manfred. Electrical testing instrument. 260,619, 9-8-81, Cl. D10-78.000.
Kostoff, Paul S. Combined merchandise advertising and telephone order booth. 260,581, 9-8-81, Cl. D6-25.000.
Kowalski, Daniel J., to Four Star Corporation. Side rail for a land vehicle luggage rack. 260,631, 9-8-81, Cl. D12-157.000.
Kress, George: *See*—
Appel, Mel; and Kress, George, 260,595, Cl. D7-76.000.
Kubota, Ltd.: *See*—
Kawaguchi, Yasuji, 260,601, Cl. D8-367.000.
Kurokawa, Koya: *See*—
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LaFrance Corporation: *See*—
Peroni, Peter A., 260,640, Cl. D14-114.000.
Lau Tak Shing t/a Tai Way Shing Kee-Plastic & Metal Manufactory: *See*—
Lau, Yuk Fai, 260,671, Cl. D21-212.000.
Lau, Yuk Fai, to Lau Tak Shing t/a Tai Way Shing Kee Plastic & Metal Manufactory. Plastic racket. 260,671, 9-8-81, Cl. D21-212.000.
Lawson, Phillip N., II; and Odom, James A., Jr., to Honeywell Inc. Portable electronic tester and analyzer. 260,617, 9-8-81, Cl. D10-76.000.
Lipsitz, Barry R.: *See*—
Dolinar, Kevin D.; Lipsitz, Ruth M.; and Lipsitz, Barry R., 260,593, Cl. D6-264.000.
Lipsitz, Ruth M.: *See*—
Dolinar, Kevin D.; Lipsitz, Ruth M.; and Lipsitz, Barry R., 260,593, Cl. D6-264.000.
Lockwood, David L., to Clarence Controls Inc. Split core current transformer. 260,635, 9-8-81, Cl. D13-4.000.
Long, Barry W. Insulating speaker support. 260,639, 9-8-81, Cl. D14-38.000.
Long, Stapleton, to Berkline Corporation, The. Seat. 260,585, 9-8-81, Cl. D6-71.000.
Luthy, Ernst, to C + D Consulting & Design AG. Sofa. 260,582, 9-8-81, Cl. D6-63.000.
Mallett, Mervin E. Back scratcher. 260,694, 9-8-81, Cl. D28-99.000.
Maroni, Carlo. Combined wristwatch and band. 260,615, 9-8-81, Cl. D10-32.000.
Marshall, Eric J. Sewing machine. 260,648, 9-8-81, Cl. D15-69.000.
Martin, Mary A. Doll. 260,668, 9-8-81, Cl. D21-171.000.
Mathuda Chunyuki Kabushiki Kaisha: *See*—
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Mathuda, Tokunari, to Mathuda Chunyuki Kabushiki Kaisha. Grease injector. 260,597, 9-8-81, Cl. D8-14.100.

Matsushita Electric Industrial Co., Ltd.: *See—*
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Mattel, Inc.: *See—*
Mayer, Edward, 260,660, Cl. D21-13.000.

Mayer, Edward, to Mattel, Inc. Electronic horoscope game casing or similar article. 260,660, 9-8-81, Cl. D21-13.000.

Mayer, Steve Frank: *See—*
Mayerovitch, Myron D., 260,679, Cl. D23-72.000.

Mayerovitch, Myron D., to Mayer, Steve Frank. Solar collector cell container and roof flashing assembly. 260,679, 9-8-81, Cl. D23-72.000.

McAlpin, Jerry M.; and Waites, Danny R. Toy laser weapon. 260,666, 9-8-81, Cl. D21-146.000.

McAlpin, Jerry M.; and Waites, Danny R. Toy laser pistol. 260,667, 9-8-81, Cl. D21-147.000.

McKee, James R., Jr., to Ball Corporation. Jar. 260,608, 9-8-81, Cl. D9-394.000.

McKeel, Robert K. Motorcycle console. 260,628, 9-8-81, Cl. D12-114.000.

Meeker, Paul K., to Century Products, Inc. Swing seat. 260,580, 9-8-81, Cl. D6-10.000.

Miles Laboratories, Inc.: *See—*
Collister, Kenneth D.; and Flood, James R., 260,642, Cl. D14-111.000.

Milliser, Charles E.: *See—*
Campbell, Bruce B.; and Milliser, Charles E., 260,641, Cl. D14-105.000.

Miracle Recreation Equipment Company: *See—*
Ament, Donald S.; and Ament, Duane S., 260,673, Cl. D21-246.000.

Mishiro, Benito: *See—*
Akazawa, Toshimasa; Ohta, Kikuo; Igo, Toshio; and Mishiro, Benito, 260,646, Cl. D14-73.000.

Mitsubishi Pencil Co. Ltd.: *See—*
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Muller, Ronald L.: *See—*
Rakocy, William J.; and Muller, Ronald L., 260,692, Cl. D28-35.000.

Myodo, Kenichi, to Shinko Kinzoku Kabushiki Kaisha. Kettle. 260,594, 9-8-81, Cl. D7-66.000.

Noga, Robert A. Luggage rack. 260,632, 9-8-81, Cl. D12-157.000.

North American Philips Corporation: *See—*
Rakocy, William J.; and Muller, Ronald L., 260,692, Cl. D28-35.000.

Nusz, David. Combined valet wall rack and drawer unit. 260,586, 9-8-81, Cl. D6-123.000.

O'Brien, Deborah J. Guitar stand. 260,589, 9-8-81, Cl. D6-176.000.

Odom, James A., Jr.: *See—*
Lawson, Phillip N., II; and Odom, James A., Jr., 260,617, Cl. D10-76.000.

O'Donnal, Marcel E. A., to Plasticos Panamericanos, S.A. DE C.V. Bottle and crate carrying case. 260,602, 9-8-81, Cl. D99-49.000.

O'Donnal, Marcel E. A., to Plasticos Panamericanos, S.A. DE C.V. Bottle carrying case. 260,603, 9-8-81, Cl. D99-49.000.

Ohta, Kikuo: *See—*
Akazawa, Toshimasa; Ohta, Kikuo; Igo, Toshio; and Mishiro, Benito, 260,646, Cl. D14-73.000.

Oliver, Clifford C.: *See—*
Gates, John I., 260,634, Cl. D12-183.000.

Otto, Edgar, to Therma-Tray Corporation. Insulated food service tray and cover. 260,604, 9-8-81, Cl. D9-347.000.

Outcalt, Miller. Camera and lens holder. 260,574, 9-8-81, Cl. D3-33.000.

Patterson, Ellen L.: *See—*
Payne, William C.; and Patterson, Ellen L., 260,693, Cl. D28-41.000.

Payne, William C.; and Patterson, Ellen L. Hair ornament. 260,693, 9-8-81, Cl. D28-41.000.

Perko, Inc.: *See—*
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Perlmutter, R. Michel, to Grove Foods, Inc. Kiosk. 260,587, 9-8-81, Cl. D6-146.000.

Peroni, Peter A., to LaFrance Corporation. Side panels assembly for readily disassembled instrument housing. 260,640, 9-8-81, Cl. D14-114.000.

Petersson, Bengt O. Pouring spout for a fluid container. 260,614, 9-8-81, Cl. D9-447.000.

Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See—*
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O'Donnal, Marcel E. A., 260,602, Cl. D99-49.000.
O'Donnal, Marcel E. A., 260,603, Cl. D99-49.000.

Pomponi, Roman: *See—*
Foggia, Donald; and Pomponi, Roman, 260,643, Cl. D14-60.000.

Porter, William V. Combined collapsible beach rest and carrying case. 260,577, 9-8-81, Cl. D3-43.000.

Rakocy, William J.; and Muller, Ronald L., to North American Philips Corporation. Curling iron. 260,692, 9-8-81, Cl. D28-35.000.

Roberdeaux, Lynn M. Ladder cover. 260,576, 9-8-81, Cl. D3-41.000.

Rowenta-Werke, GmbH: *See—*
Stutzer, Franz A., 260,690, Cl. D27-42.000.

Ryobi Ltd.: *See—*
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Hiraishi, Etsuo; and Sakamoto, Masakazu, 260,676, Cl. D22-23.000.

S. A. ets Lardenois: *See—*
Baudon, Maurice C., 260,579, Cl. D4-35.000.

Sacks, Ronald. Bottle. 260,606, 9-8-81, Cl. D9-309.000.

Saeki, Taisuke; Katayama, Masaharu; Kitakaze, Yoshinobu; Arai, Noriyuki; Takahashi, Hideo; Kurokawa, Koya; and Shimose, Norihiko, to Matsushita Electric Industrial Co., Ltd. Camera for video tape recorder. 260,647, 9-8-81, Cl. D14-78.000.

Sakamoto, Masakazu: *See—*
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Santa Eulalia, Javier B. C.: *See—*
Santa Eulalia, Jesus A. C.; and Santa Eulalia, Javier B. C., 260,624, Cl. D11-158.000.

Santa Eulalia, Jesus A. C.; and Santa Eulalia, Javier B. C., to John J. Madison Company, Inc. Figurine of an antelope. 260,624, 9-8-81, Cl. D11-158.000.

Saunders, David T. Liquid dispenser. 260,605, 9-8-81, Cl. D9-300.000.

Schoolcraft, Robert M. Novelty statuette. 260,625, 9-8-81, Cl. D11-131.000.

Shachihata Industrial Co., Ltd.: *See—*
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Funahashi, Tatsuro, 260,657, Cl. D19-43.000.

Shimose, Norihiko: *See—*
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Shinko Kinzoku Kabushiki Kaisha: *See—*
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Simmons, Bruce D.; and Sircy, William A. Archer's bow holder. 260,674, 9-8-81, Cl. D22-13.000.

Sircy, William A.: *See—*
Simmons, Bruce D.; and Sircy, William A., 260,674, Cl. D22-13.000.

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Greenblatt, David; and Spinoza, Rick, 260,571, Cl. D2-321.000.
Greenblatt, David; and Spinoza, Rick, 260,572, Cl. D2-321.000.

Stockard, Larry. Balance game apparatus. 260,659, 9-8-81, Cl. D19-59.000.

Storms, Bobby D. Combined disposable cigarette lighter and cigarette package holder. 260,689, 9-8-81, Cl. D27-37.000.

Stoy, Raymond P., to American Home Products Corp. Container for liquid. 260,607, 9-8-81, Cl. D9-389.000.

Stutzer, Franz A., to Rowenta-Werke, GmbH. Lighter. 260,690, 9-8-81, Cl. D27-42.000.

Super Hooper Corporation: *See—*
Armstrong, Jerry A., 260,669, Cl. D21-201.000.
Armstrong, Jerry A., 260,670, Cl. D21-201.000.

T-Shirts Plus, Inc.: *See—*
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Takahashi, Hideo: *See—*
Saeki, Taisuke; Katayama, Masaharu; Kitakaze, Yoshinobu; Arai, Noriyuki; Takahashi, Hideo; Kurokawa, Koya; and Shimose, Norihiko, 260,647, Cl. D14-78.000.

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ISSUED SEPTEMBER 8, 1981

NOTE.—First number, class; second number, subclass; third number, patent number

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2.5 4,287,607
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CLASS 82

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871 4,287,801

CLASS 84

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1.06 4,287,803
1.11 Re.30,736
1.19 4,287,804
1.26 4,287,805
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CLASS 87

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434 4,287,813

CLASS 92

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CLASS 99

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CLASS 101

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CLASS 110

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270 4,288,066

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87.04 A 4,288,088
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293 4,288,090
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605 4,288,092
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623 4,288,094
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364 4,288,116

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CLASS 329

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CLASS 330

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94.5 PE 4,288,758

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173 4,288,769
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230 4,288,771

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229 4,288,865

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CLASS 367

11 4,288,866
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142 4,288,183
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342 4,288,193
586 4,288,194
608 4,288,195
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142 4,288,202

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510 4,288,423

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582 4,288,465

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120 4,288,471
133 4,288,472
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209 4,288,507
218 4,288,508

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213 4,288,522
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315 4,288,530
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522 4,288,534
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14 4,288,541
15 4,288,542
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39 4,288,544
42 4,288,545
70 4,288,546
80 4,288,547
94 4,288,548
119 4,288,549
167 4,288,550
168 4,288,551
174 4,288,552
188 4,288,553
247 4,288,554
254 4,288,555
265 4,288,556
272 4,288,557

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CLASS 455

197 4,288,875
214 4,288,876

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345 4,288,224
420 4,288,067

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105 4,288,251

CLASS 518

716 4,288,558

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90 4,288,560
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262 4,288,583
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204 4,288,594
250 4,288,595

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265 4,288,597
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133 4,288,611
159 4,288,612
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345 4,288,624
372 4,288,625
491 4,288,626

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65 4,288,628
330 4,288,629
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367 4,288,632
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454 4,288,634
483 4,288,635
486 4,288,636
575 4,288,637
584 4,288,638
625 4,288,639
855 4,288,640
4,288,641
903 4,288,642

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324 4,288,643
360 4,288,644
415 4,288,645
458 4,288,646
467 4,288,647
523 4,288,648
533 4,288,649

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	321	260,571		234	260,592	D10—	32	260,615		15	260,636			260,657		53	260,678
		260,572		264	260,593		65	260,616		32	260,637		49	260,658		72	260,679
D3—	18	260,573	D7—	66	260,594		76	260,617	D14—	33	260,638		59	260,659		97	260,680
	33	260,574		76	260,595		78	260,618		38	260,639	D21—	13	260,660	D24—	27	260,681
	36	260,575		193	260,596			260,619		60	260,643		34	260,661	D25—	23	260,682
	41	260,576	D8—	14.1	260,597	D11—	3	260,620		68	260,644		108	260,662		65	260,683
	43	260,577		71	260,598		5	260,621		70	260,645		134	260,663		74	260,684
	52	260,578		82	260,599		75	260,622		73	260,646			260,664	D26—	91	260,685
D4—	35	260,579		356	260,600		131	260,625		78	260,647		136	260,665		99	260,686
D6—	10	260,580		367	260,601		157	260,623		105	260,641		146	260,666			260,687
	25	260,581	D9—	300	260,605		158	260,624		111	260,642		147	260,667		142	260,688
	63	260,582		309	260,606		160	260,626		114	260,640		171	260,668	D27—	37	260,689
	64	260,583		347	260,604	D12—	91	260,627	D15—	69	260,648		201	260,669		42	260,690
	69	260,584		389	260,607		114	260,628		105	260,649			260,670	D28—	8.1	260,691
	71	260,585		394	260,608		142	260,629		147	260,650		212	260,671		35	260,692
	123	260,586		403	260,609		155	260,630		199	260,651		234	260,672		41	260,693
	146	260,587		413	260,610		157	260,631			260,652		246	260,673		99	260,694
	153	260,588			260,611			260,632	D16—	27	260,653	D22—	13	260,674	D99—	49	260,602
	176	260,589		424	260,612			260,633	D17—	6	260,654		23	260,675			260,603
	191	260,590			260,613		183	260,634		22	260,655			260,676			

CLASSIFICATION OF PLANTS

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PATENTS

6 :	4,288,021		4,288,314		4,287,731		4,287,959		4,288,743		4,288,762
	4,288,870		4,288,336		4,287,825		4,288,156		4,288,819		4,288,876
01 :	4,288,173		4,288,343		4,287,857		4,288,471		4,288,831	25 :	4,287,628
	4,288,328		4,288,373		4,287,937		4,288,551	18 :	4,287,652		4,287,637
04 :	4,287,620		4,288,384		4,287,941	16 :	4,287,679		4,287,671		4,287,769
	4,287,641		4,288,408		4,288,033		4,287,722		4,287,689		4,287,869
	4,287,739		4,288,461		4,288,042	17 :	Re.30,734		4,287,717		4,287,882
	4,287,785		4,288,519		4,288,075		Re.30,738		4,287,720		4,287,899
	4,287,826		4,288,537		4,288,148		4,287,613		4,287,855		4,288,017
	4,288,814		4,288,553		4,288,199		4,287,662		4,287,879		4,288,057
	4,288,850		4,288,568		4,288,259		4,287,673		4,287,904		4,288,137
05 :	4,287,960		4,288,605		4,288,273		4,287,719		4,288,000		4,288,153
06 :	4,287,619		4,288,612		4,288,293		4,287,746		4,288,047		4,288,174
	4,287,623		4,288,621		4,288,462		4,287,752		4,288,119		4,288,235
	4,287,625		4,288,646		4,288,543		4,287,777		4,288,135		4,288,280
	4,287,631		4,288,658		4,288,587		4,287,780		4,288,190		4,288,303
	4,287,635		4,288,659		4,288,604		4,287,789		4,288,430		4,288,325
	4,287,648		4,288,661		4,288,656		4,287,805		4,288,541		4,288,424
	4,287,653		4,288,670		4,288,769		4,287,813		4,288,549		4,288,479
	4,287,740		4,288,674		4,288,770		4,287,889		4,288,624		4,288,513
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	4,287,833		4,288,782		4,288,383		4,287,994		4,287,627		4,288,713
	4,287,835		4,288,786		4,288,574		4,287,999		4,288,133		4,288,741
	4,287,838		4,288,801		4,288,576		4,288,015		4,288,613		4,288,745
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	4,287,883		4,288,806		4,287,792		4,288,052	21 :	4,287,692		4,288,834
	4,287,890		4,288,836	12 :	4,287,618		4,288,071		4,287,939		4,288,843
	4,287,957		4,288,856		4,287,630		4,288,086		4,288,013		4,288,848
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	4,288,006		4,288,866		4,287,713		4,288,128		4,288,138		4,287,654
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	4,288,023		4,287,705		4,287,763		4,288,172	22 :	4,287,701		4,287,863
	4,288,041		4,287,708		4,287,816		4,288,197		4,287,818		4,287,865
	4,288,049		4,287,868		4,287,877		4,288,206		4,288,406		4,287,878
	4,288,060		4,287,886		4,287,905		4,288,215		4,288,578		4,287,914
	4,288,092		4,287,912		4,287,907		4,288,222	23 :	4,287,762		4,287,991
	4,288,116		4,287,951		4,287,956		4,288,264		4,287,962		4,288,028
	4,288,124		4,287,972		4,288,007		4,288,270		4,288,195		4,288,053
	4,288,146		4,287,996		4,288,011		4,288,295		4,288,480		4,288,062
	4,288,147		4,288,[illegible]09		4,288,084		4,288,504		4,288,498		4,288,069
	4,288,149		4,288,140		4,288,201		4,288,548	24 :	4,287,824		4,288,111
	4,288,161		4,288,200		4,288,323		4,288,580		4,288,079		4,288,129
	4,288,169		4,288,282		4,288,455		4,288,588		4,288,132		4,288,180
	4,288,176		4,288,308		4,288,501		4,288,649		4,288,400		4,288,182
	4,288,202		4,288,414	13 :	4,287,798		4,288,655		4,288,427		4,288,196
	4,288,229		4,288,857		4,287,823		4,288,657		4,288,476		4,288,232
	4,288,262	09 :	4,287,651		4,287,901		4,288,686		4,288,527		4,288,233
	4,288,291		4,287,706		4,287,934		4,288,718		4,288,733		4,288,296

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